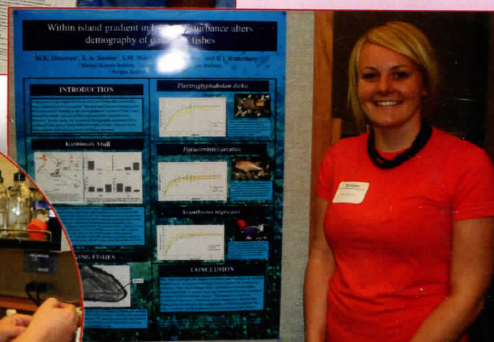
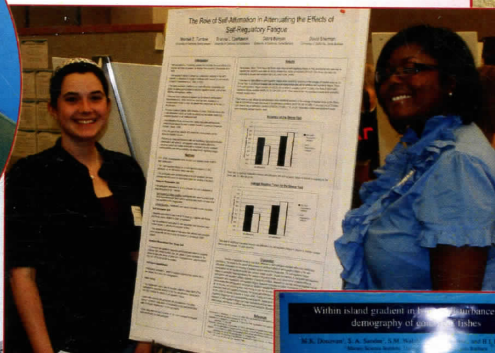


UCSB

2010

Undergraduate Research Colloquium

Celebrating Undergraduate Research and Creative Activities at UCSB



UNIVERSITY OF CALIFORNIA, SANTA BARBARA

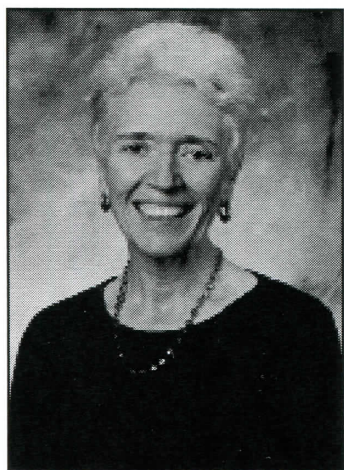
2010

Undergraduate Research Colloquium

Sponsored by:
College of Letters and Science
Undergraduate Research and Creative Activities Office



Message from Acting Dean of Undergraduate Education



Mary Nisbet
Acting Dean of Undergraduate Education
College of Letters and Science

Welcome to UCSB's Annual Undergraduate Research Colloquium where we celebrate the scholarly achievements of our students. Students from the College of Letters and Science, the College of Engineering, and the College of Creative Studies are represented here today, and on behalf of my faculty colleagues in the three colleges, I want to congratulate all of them.

Undergraduate participation in the research and creative mission of UCSB is a hallmark of our undergraduates' educational experiences. Building upon their classroom learning, the students presenting their work today have participated in a challenging and exciting endeavor. These students have worked more independently than in traditional classes and have applied all their imaginative energies to help create new knowledge. In many ways, they represent the epitome of how a major research university ought to educate students.

At UCSB we are fortunate to have such a large number of faculty who readily agree to mentor outstanding students in their research and creative activities. The faculty's guidance, support, and inspiration are essential. On behalf of all the student presenters, I extend a hearty "thank you" to the faculty mentors.

I also want to thank two groups without whom today's event could not have taken place. First, grateful thanks to the individuals and agencies listed in this brochure that have provided funding to support the projects presented here today. Second, thanks are also due to the faculty reviewers who work within very tight deadlines to provide invaluable reviews and assessment of the projects that have been submitted for funding.

In the following pages we present abstracts of today's presentations listed in alphabetical order by student name. Good luck to all the students whose hard work, occasional frustration, and tremendous sense of accomplishment are on display today.

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Special Thanks & Acknowledgements

We would like to
thank the
following
individuals and groups for
supporting undergraduate
research and creative activities
at UCSB through the URCA
Office during the 2009–2010
academic year.

Funding Agencies

Executive Vice Chancellor Gene Lucas
Vice Chancellor of Research Michael Witherell
The McNair Scholars Program
Miscellaneous Donors to the UCSB Foundation

Faculty Reviewers

Senior Associate Dean Dawn Holmes
Associate Dean Steve Allaback
Associate Dean John Park
Associate Dean Allan Stewart-Oaten
Associate Dean Andre Wyss

Faculty Mentors

Tamara Afifi, Communication
Walid Afifi, Communication
S. James Allen, Physics
Jackie Apodaca, Film and Media Studies
Stephanie Batiste, Black Studies and English
Glenn Beltz, Mechanical Engineering
Bilge Birsoy, Molecular, Cellular, and Developmental Biology
Carol Blanchette, Molecular, Cellular, and Developmental Biology
James Blascovich, Psychology
Eileen Boris, Feminist Studies
Dirk Bouwmeester, Physics
John Bowers, Electrical and Computer Engineering
Edward Branigan, Film and Media Studies
Kathleen Bruhn, Political Science
Ann Bruice, Theater and Dance
Mary Bucholtz, Linguistics
Francesco Bullo, Mechanical Engineering
Randy Busto, Religious Studies
Manuel Callahan, Chicana and Chicano Studies
Bradley Cardinale, Ecology, Evolution, and Marine Biology
Craig Carlson, Ecology, Evolution, and Marine Biology
Dolores Inez Casillas, Chicana and Chicano Studies
Jennifer Casselle, Marine Science Institute
Andrew Cleland, Physics
Sarah Cline, History
Nadege Clitandre, Center for Black Studies Research
Justin Cochran, Chemistry and Biochemistry
Benjamin Cohen, Political Science
Patricia Cohen, History
Nancy Collins, Psychology
Collie Conoley, Gevirtz Graduate School of Education
Leda Cosmides, Psychology
Emille Davie, Mathematics
Mattanjah de Vries, Chemistry and Biochemistry
Erin Dowdy, Gevirtz Graduate School of Education
Francis Dutra, History
Aaron Ettenberg, Psychology
Simonetta Falasca-Zamponi, Sociology
Ruth Finkelstein, Molecular, Cellular, and Developmental Biology

Claudio Fogu, French and Italian
 Diane Fujino, Asian American Studies
 Deborah Fygenson, Physics
 Shelly Gable, Psychology
 Ralph Gallucci, Classics
 Wade Grabow, Chemistry and Biochemistry
 Michael Gurven, Anthrology
 Elisabeth Gwinn, Physics
 Paul Hansma, Physics
 Ambi Harsha, Asian American Studies
 Craig Hawker, Chemistry and Biochemistry
 Ryan Hechinger, Marine Science Institute
 Gretchen Hofmann, Ecology, Evolution, and Marine Biology
 Jennifer Holt, Film and Media Studies
 Cynthia Hudley, Gevirtz Graduate School of Education
 Tania Israel, Gevirtz Graduate School of Education
 Skirmantas Janusonis, Psychology
 Shane Jimerson, Gevirtz Graduate School of Education
 Laura Kalman, History
 Cynthia Kaplan, Political Science
 Heejung Kim, Psychology
 Mira Kingsley, Theater and Dance
 Franklin Kinnaman, Earth Science
 Todd Kippin, Psychology
 Kenneth Kosik, Molecular, Cellular, and Developmental Biology
 Peter Kuhn, Economics
 Armand Kuris, Ecology, Evolution, and Marine Biology
 Carol Lansing, History
 George Lipsitz, Sociology and Black Studies
 David Low, Molecular, Cellular, and Developmental Biology
 Philip Lubin, Physics
 Michael Ludkovski, Statistics and Applied Probability
 Diane Mackie, Psychology
 Donald Marolf, Physics
 Eric Matthys, Mechanical Engineering
 Richard Mayer, Psychology
 Eric McFarland, Chemical Engineering
 Sears McGee, History
 Marianne Mithun, Linguistics
 Delila Moseley, Theater and Dance
 Charles Mullin, Communication
 Karen Myers, Communication
 Maria Napoli, Mechanical Engineering
 Thuc-Quyen Nguyen, Chemistry and Biochemistry
 Patrick O'Neill, Physics
 Eduardo Orias, Molecular, Cellular, and Developmental Biology
 Henry M. Page, Marine Science Institute
 Juan-Vicente Palerm, Anthrology
 Christopher Palmstrom, Electrical and Computer Engineering and Materials
 Sameer Pandya, Asian American Studies
 Lisa Parks, Film and Media Studies
 Thomas Pettus, Chemistry and Biochemistry
 Susannah Porter, Earth Science
 Erika Rappaport, History
 Robert Rauchhaus, Political Science
 Daniel Reed, Marine Science Institute
 Harry Reese, Art
 Ronald Rice, Communication
 Victor Rios, Sociology

James Roney, Psychology
Horacio Roque Ramirez, Chicana and Chicano Studies
Joel Rothman, Molecular, Cellular, and Developmental Biology
Stephen Rothstein, Ecology, Evolution, and Marine Biology
Leila Rupp, Feminist Studies
Beth Schneider, Sociology
Denise Segura, Sociology
David Seibold, Communication
Steven R. Smith, Gervirtz Graduate School of Education
Paul Spickard, History and Asian American Studies
Cynthia Stohl, Communication
Michael Stohl, Communication
Roberto Strongman, Black Studies
Karen Szumlinski, Psychology
John Talbott, History
Luke Theogarajan, Electrical and Computer Engineering
Barbara Tomlinson, Feminist Studies
David Valentine, Earth Science
Christian Van de Walle, Materials
Candace Waid, English
Mingfeng Wang, Chemistry and Biochemistry
Leslie Wilson, Molecular, Cellular, and Developmental Biology
Clyde Woods, Black Studies
Fred Wudl, Chemistry and Biochemistry
Salim Yaqub, History
Kim Yasuda, Art
Pauline Yu, Marine Science Institute

Event Facilitators

Helen Bartley
Central Stores Furniture Services
Jim Petrini, Wilson Printing
The University Center Conference Services Staff



Congratulations to the McNair Scholars presenting at the
2010 UCSB Colloquium on Undergraduate Research



McNair Graduating Seniors:

- Lisette Arellano- College of Creative Studies, Biology
- Lizette Arevalo- Sociology & Chicana/o Studies
- Todd Avellar- Psychology
- Sondrina Bullitt- Sociology & Black Studies
- Angélica Camacho- Black Studies & Chicana/o Studies
- Jorge Cuellar- Latin American Iberian Studies & Film Studies
- Sharde' Davis- Feminist Studies & Communication
- Racquel Domingo- Microbiology
- Sebastian Ferrada- Global Studies & Chicana/o Studies
- Anita Juarez- Sociology & Chicana/o Studies
- Gabriella Lopez- Anthropology
- Jose Lumbreras- Sociology
- Kristopher "Eric" Martin- Physics
- Ahmad Nabhan- Pharmacology
- Deseray Solis- Chicana/o Studies

McNair Juniors:

- Janett Barragan- Political Science & Chicana/o Studies
- Precious Boone- Black Studies
- Lynette Cortes- Mathematics
- Kristen Dunkinson- Linguistics
- Richard Espinoza- Psychology
- Marites Villarosa Garcia- College of Creative Studies, Biology
- Anna Giang- Sociology
- Bashir Hassan- Sociology & Black Studies
- Brianna Jones -Aquatic Biology
- Nancy Martinez- Psychology
- Saul Martinez- Biology
- Eduardo Mercado- Chemistry
- Paul Monge-Rodriguez - Global Studies & Sociology
- Robert Norton- Chemical Engineering
- Eziaku Nwokocha- Feminist Studies & Black Studies
- Carla San Jose-Interdisciplinary: Linguistics, Psychology, Speech & Hearing
- Nathaniel Scheidemen- Sociology
- Corinne Stanley- Black Studies

Participants by College

College of Creative Studies

Space	Name
77	Axline, Christopher
8	Bedford, Jason
51	Carroll, Nicole
67	Downes, Jo
87	Ellis, Vincenzo
43	Gilewski, Alex
122	Kally, James C.
16	Kaye, Bryan
5	LaPointe, Angelina
102	Lawrence, Jade
118	Navas, Gabriela
130	Nguyen, Kayla
126	Quistad, Steven
141	Roebber, Elinore
134	Tang, Jessica
83	Troesch, Alexander
81	Velsko, Irina
137	Villarosa Garcia, Marites

College of Engineering

Space	Name
146	Arnold, Michael
99	Chesnut, Eneida
146	Cortez, Josue
85	Handa, Sharice
61	Herrick, David
85	Kolev, Veselin
14	Labrador, Natalie
112	Morales, Alex
10	Morton, Danielle
69	Munoz, Andres
146	Myer, Harold
30	Nguyen, Michelle
35	Norton, Robert
146	Owen, Kyle
10	Pourian, Niloufar
146	Schmiess, Michael

College of Letters and Science

Space	Name
117	Aleman-Tovar, Janeth
127	Alvarado, Andrew
142	Andrews Cordeiro, Sara
64	Arévalo, Lizette
124	Avellar, Todd

Space	Name
38	Badley, Chip
104	Baghdassarian, Alexa
39	Barquin, Salvacion
25	Barragan, Jenett
40	Bartlow, Alexis
79	Baxter, Amanda
2	Bobco, Nicole
13	Boone, Precious
22	Bruccheri, Kaitlyn
29	Buerner, Kyrsten
114	Buhler, Charles
125	Bullitt, Sondrina
86	Cellar, Jorge
15	Cho, Sarah
128	Chorneau, Alice
48	Chou, Winston
12	Christie, Jocelyn
28	Cole, Lauren
45	Cook, Matthew
41	Cornwell, Madison
71	Cortes, Lynette
66	Cosic, Milica
31	Cui, Stanley
56	Danetra, Danielle
60	Daniels, Hunter
147	Davis, Sharde
135	Dickson, Eleanor
92	Domingo, Racquel
24	Dror, Adi
119	Engleman, Alysse
28	Ennis, April
116	Espinoza, Richard
11	Faquiryan, Hamed
131	Ferrada, Juan Sebastian
6	Flood, Zachary
136	Fragosa, Alexis
80	Franken, Logan
76	Giang, Anna
55	Ginther, Nicole
6	Gordon, Denna
33	Guemo, Marvin
34	Guemo, Marvin
68	Hammond, Jessica
20	Hansen, Connor
142	Harvey, Sean
46	Hassan, Bashir
3	Hernandez, Ebelyn
42	Hoppe, Kaila
75	Hughes, Spenser
37	Jones, Brianna
82	Juarez, Anita
132	Kadin, Jacqueline

Participants by College

Space	Name	Space	Name
15	Kang, Se Young	150	Roberts, Christopher
113	Kanter, Maggie	110	Roukos, Carly
145	Khosharay, Radhika	65	Rowley, Matthew
94	Khoubian, Steven	144	San Jose, Carla
111	Kinghorn, Kiara	115	Scheidemen, Nathaniel
4	Kobernick, Elana	148	Short, Sandra
18	Koenig, Lauren	26	Silbert, Matthew
1	Kosh, Audra	70	Solis, Deseray
93	Kovach, Matthew	23	Stanley, Corinne
151	Kwon, Catherine	78	Stewart, Mitchell
72	Leonelli, Philomen	27	Swank, Zoe
101	Levoff, Connor	20	Terry, Arianne
53	Lewis, Braden	149	Thoe, Erica
17	Lindt, Rachel	58	Thorne, Elizabeth
63	Long, Holly	49	Tran, Leinah
9	Lopez, Gabriella	22	Van Woy, Lauren
97	Lopez, Hiram	108	Velazquez, Lourdes
89	Lumbreras, Jose	129	Veluz, Myra Joy
90	Luu, Jason	57	Villanueva, Christie
143	MacNamara, Andrew	84	Weinger, Mackenzie
19	Madison, Joshua	32	Weitekamp, Paul
21	Mardo, Paola	105	White, Megan
73	Marino, Clark	104	Wilk, Lindsey
152	Martin, Kristopher Eric	95	Woods, Shauna
139	Martinez, Nancy	109	Yedor, Leslie
47	Martinez, Saul		
50	Mason, Christy		
107	Massenkoff, Maxim		
62	Maxwell, Rheannon		
74	McHugh, Tyler		
121	McSweeney, Christine		
59	Mercado, Eduardo		
88	Monge-Rodriguez, Paul		
91	Moore, Madeleine		
52	Morgan, India		
100	Mueller		
103	Munoz, Alyssa		
123	Muñoz, Amanda		
120	Murillo, Joshua		
140	Nelson, Craig		
106	Nemirow, Jason		
116	Norman, Kaila		
36	Nwokocha, Eziaku		
100	Ofer, Oren		
98	O'Keefe, Stephanie		
111	Orozco, Mia		
7	Pangelinan, Ashley		
96	Petifils, Michelle		
133	Presentati, Cassandra		
44	Reik, Dana		
54	Reul, Margaret		
138	Richardson, Emily		

Participants by Last Name

SPACE	NAME	SPACE	NAME
117	Aleman-Tovar, Janeth	85	Handa, Sharice
127	Alvarado, Andrew	20	Hansen, Connor
142	Andrews Cordeiro, Sara	142	Harvey, Sean
64	Arévalo, Lizette	46	Hassan, Bashir
146	Arnold, Michael	3	Hernandez, Ebelyn
124	Avellar, Todd	61	Herrick, David
77	Axline, Christopher	42	Hoppe, Kaila
38	Badley, Chip	75	Hughes, Spenser
104	Baghdassarian, Alexa	37	Jones, Brianna
39	Barquin, Salvacion	82	Juarez, Anita
25	Barragan, Jenett	132	Kadin, Jacqueline
40	Bartlow, Alexis	122	Kally, James C.
79	Baxter, Amanda	15	Kang, Se Young
8	Bedford, Jason	113	Kanter, Maggie
2	Bobco, Nicole	16	Kaye, Bryan
13	Boone, Precious	145	Khosharay, Radhika
22	Bruccheri, Kaitlyn	94	Khoubian, Steven
29	Buerner, Kyrsten	111	Kinghorn, Kiara
114	Buhler, Charles	4	Koernick, Elana
125	Bullitt, Sondrina	18	Koenig, Lauren
51	Carroll, Nicole	85	Kolev, Veselin
86	Cellar, Jorge	1	Kosh, Audra
99	Chesnut, Eneida	93	Kovach, Matthew
15	Cho, Sarah	151	Kwon, Catherine
128	Chorneau, Alice	14	Labrador, Natalie
48	Chou, Winston	5	LaPointe, Angelina
12	Christie, Jocelyn	102	Lawrence, Jade
28	Cole, Lauren	72	Leonelli, Philomen
45	Cook, Matthew	101	Levoff, Connor
41	Cornwell, Madison	53	Lewis, Braden
71	Cortes, Lynette	17	Lindt, Rachel
146	Cortez, Josue	63	Long, Holly
66	Cosic, Milica	9	Lopez, Gabriella
31	Cui, Stanley	97	Lopez, Hiram
56	Danetra, Danielle	89	Lumbreras, Jose
60	Daniels, Hunter	90	Luu, Jason
147	Davis, Sharde	143	MacNamara, Andrew
135	Dickson, Eleanor	19	Madison, Joshua
92	Domingo, Racquel	21	Mardo, Paola
67	Downes, Jo	73	Marino, Clark
24	Dror, Adi	152	Martin, Kristopher Eric
87	Ellis, Vincenzo	139	Martinez, Nancy
119	Engleman, Alysse	47	Martinez, Saul
28	Ennis, April	50	Mason, Christy
116	Espinoza, Richard	107	Massenkoff, Maxim
11	Faquiryan, Hamed	62	Maxwell, Rheannon
131	Ferrada, Juan Sebastian	74	McHugh, Tyler
6	Flood, Zachary	121	McSweeney, Christine
136	Fragosa, Alexis	59	Mercado, Eduardo
80	Franken, Logan	88	Monge-Rodriguez, Paul
76	Giang, Anna	91	Moore, Madeleine
43	Gilewski, Alex	112	Morales, Alex
55	Ginther, Nicole	52	Morgan, India
6	Gordon, Denna	10	Morton, Danielle
33	Guemo, Marvin	100	Mueller
34	Guemo, Marvin	103	Munoz, Alyssa
68	Hammond, Jessica	123	Muñoz, Amanda

Participants by Last Name

SPACE	NAME
69	Munoz, Andres
120	Murillo, Joshua
146	Myer, Harold
118	Navas, Gabriela
140	Nelson, Craig
106	Nemirow, Jason
130	Nguyen, Kayla
30	Nguyen, Michelle
116	Norman, Kaila
35	Norton, Robert
36	Nwokocha, Eziaku
100	Ofer, Oren
98	O'Keefe, Stephanie
111	Orozco, Mia
146	Owen, Kyle
7	Pangelinan, Ashley
96	Petifils, Michelle
10	Pourian, Niloufar
133	Presentati, Cassandra
126	Quistad, Steven
44	Reik, Dana
54	Reul, Margaret
138	Richardson, Emily
150	Roberts, Christopher
141	Roebber, Elinore
110	Roukos, Carly
65	Rowley, Matthew
144	San Jose, Carla
115	Scheidemen, Nathaniel
146	Schmiess, Michael
148	Short, Sandra
26	Silbert, Matthew
70	Solis, Deseray
23	Stanley, Corinne
78	Stewart, Mitchell
27	Swank, Zoe
134	Tang, Jessica
20	Terry, Arianne
149	Thoe, Erica
58	Thorne, Elizabeth
49	Tran, Leinah
83	Troesch, Alexander
22	Van Woy, Lauren
108	Velazquez, Lourdes
81	Velsko, Irina
129	Veluz, Myra Joy
57	Villanueva, Christie
137	Villarosa Garcia, Marites
84	Weinger, Mackenzie
32	Weitekamp, Paul
105	White, Megan
104	Wilk, Lindsey
95	Woods, Shauna
109	Yedor, Leslie

Participants by Space

SPACE	NAME	SPACE	NAME
1	Kosh, Audra	48	Chou, Winston
2	Bobco, Nicole	49	Tran, Leinah
3	Hernandez, Ebelyn	50	Mason, Christy
4	Kobernick, Elana	51	Carroll, Nicole
5	LaPointe, Angelina	52	Morgan, India
6	Gordon, Denna	53	Lewis, Braden
6	Flood, Zachary	54	Reul, Margaret
7	Pangelinan, Ashley	55	Ginther, Nicole
8	Bedford, Jason	56	Danetra, Danielle
9	Lopez, Gabriella	57	Villanueva, Christie
10	Morton, Danielle	58	Thorne, Elizabeth
10	Pourian, Niloufar	59	Mercado, Eduardo
11	Faquiryan, Hamed	60	Daniels, Hunter
12	Christie, Jocelyn	61	Herrick, David
13	Boone, Precious	62	Maxwell, Rheannon
14	Labrador, Natalie	63	Long, Holly
15	Kang, Se Young	64	Arévalo, Lizette
15	Cho, Sarah	65	Rowley, Matthew
16	Kaye, Bryan	66	Cosic, Milica
17	Lindt, Rachel	67	Downes, Jo
18	Koenig, Lauren	68	Hammond, Jessica
19	Madison, Joshua	69	Munoz, Andres
20	Terry, Arianne	70	Solis, Deseray
20	Hansen, Connor	71	Cortes, Lynette
21	Mardo, Paola	72	Leonelli, Philomen
22	Bruccheri, Kaitlyn	73	Marino, Clark
22	Van Woy, Lauren	74	McHugh, Tyler
23	Stanley, Corinne	75	Hughes, Spenser
24	Dror, Adi	76	Giang, Anna
25	Barragan, Jenett	77	Axline, Christopher
26	Silbert, Matthew	78	Stewart, Mitchell
27	Swank, Zoe	79	Baxter, Amanda
28	Ennis, April	80	Franken, Logan
28	Cole, Lauren	81	Velsko, Irina
29	Buerner, Kyrsten	82	Juarez, Anita
30	Nguyen, Michelle	83	Troesch, Alexander
31	Cui, Stanley	84	Weinger, Mackenzie
32	Weitekamp, Paul	85	Handa, Sharice
33	Guemo, Marvin	85	Kolev, Veselin
34	Guemo, Marvin	86	Cellar, Jorge
35	Norton, Robert	87	Ellis, Vincenzo
36	Nwokocha, Eziaku	88	Monge-Rodriguez, Paul
37	Jones, Brianna	89	Lumbreras, Jose
38	Badley, Chip	90	Luu, Jason
39	Barquin, Salvacion	91	Moore, Madeleine
40	Bartlow, Alexis	92	Domingo, Racquel
41	Cornwell, Madison	93	Kovach, Matthew
42	Hoppe, Kaila	94	Khoubian, Steven
43	Gilewski, Alex	95	Woods, Shauna
44	Reik, Dana	96	Petifils, Michelle
45	Cook, Matthew	97	Lopez, Hiram
46	Hassan, Bashir	98	O'Keefe, Stephanie
47	Martinez, Saul	99	Chesnut, Eneida

Participants by Space

SPACE	NAME	SPACE	NAME
100	Mueller	146	Myer, Harold
100	Ofer, Oren	146	Owen, Kyle
101	Levoff, Connor	146	Schmiess, Michael
102	Lawrence, Jade	147	Davis, Sharde
103	Munoz, Alyssa	148	Short, Sandra
104	Baghdassarian, Alexa	149	Thoe, Erica
104	Wilk, Lindsey	150	Roberts, Christopher
105	White, Megan	151	Kwon, Catherine
106	Nemirow, Jason	152	Martin, Kristopher Eric
107	Massenkoff, Maxim		
108	Velazquez, Lourdes		
109	Yedor, Leslie		
110	Roukos, Carly		
111	Orozco, Mia		
111	Kinghorn, Kiara		
112	Morales, Alex		
113	Kanter, Maggie		
114	Buhler, Charles		
115	Scheidemen, Nathaniel		
116	Norman, Kaila		
116	Espinoza, Richard		
117	Aleman-Tovar, Janeth		
118	Navas, Gabriela		
119	Engleman, Alysse		
120	Murillo, Joshua		
121	McSweeney, Christine		
122	Kally, James C.		
123	Muñoz, Amanda		
124	Avellar, Todd		
125	Bullitt, Sondrina		
126	Quistad, Steven		
127	Alvarado, Andrew		
128	Chorneau, Alice		
129	Veluz, Myra Joy		
130	Nguyen, Kayla		
131	Ferrada, Juan Sebastian		
132	Kadin, Jacqueline		
133	Presentati, Cassandra		
134	Tang, Jessica		
135	Dickson, Eleanor		
136	Fragosa, Alexis		
137	Villarosa Garcia, Marites		
138	Richardson, Emily		
139	Martinez, Nancy		
140	Nelson, Craig		
141	Roebber, Elinore		
142	Andrews Cordeiro, Sara		
142	Harvey, Sean		
143	MacNamara, Andrew		
144	San Jose, Carla		
145	Khosharay, Radhika		
146	Arnold, Michael		
146	Cortez, Josue		

Abstracts—Group Projects

News Coverage of Actors' Negotiations

S. Andrews Cordeiro, S. Harvey

R. Rice - Communication

This study examines news coverage of labor negotiations in order to illustrate how framing of labor unions in news media has evolved. A news frame is "... a central organizing idea or story line that provides meaning to an unfolding strip of events, weaving connection among them" (Gamson & Modigliani, 1987, p. 143). The dispute between the Screen Actors Guild and the Alliance for Motion Picture and Television Producers has been selected to elucidate how framing of labor unions in news media has changed our perceptions of labor negotiations. Research suggests that that media coverage between labor organizations overall has declined (Park & Wright, 2007). Negative coverage (has focused disproportionately on labor disputes and industrial action (Bruno, 2008), emphasizing economic consequences of industrial action while ignoring substantive issues of industrial conflicts (Martin, 2008). For this study, we assembled a purposive sample of all articles related to the AMPTP-SAG negotiations from The New York Times (n= 57), The Los Angeles Times (n=71), and The Hollywood Reporter (n=31). We hypothesize that news coverage will 1) focus more often on strategies/actions rather than substantive issues; 2) focus more often on disagreement than on common ground between the sides; 3) emphasize division within the union or between SAG and other unions more often than support; and 4) focus on the economic consequences of the union's actions more often than the producers' actions. Our research question seeks to address the extent to which the AMPTP-SAG dispute is depicted in the news media as difficult to resolve over time, thus prolonging conflict. We expect our results to provide support for our hypotheses.

EWB: Water Chlorination Device

M. Arnold, J. Cortez, H. Myer, K.Owen, M. Schmeiss

G. Beltz - Mechanical Engineering

Many rural areas around the world lack proper water sanitation and any consumption of this water can cause illness. For this reason, rural areas often depend on chlorine, a low cost, readily available resource that safely and reliably sanitizes water. In the Andean highlands of Peru, the local government requires rural areas to chlorinate

their water supply as a means of ensuring safe drinking water. Unfortunately, the crude system that the government provides these communities is neither reliable nor accurate at metering the chlorine. The EWB-UCSB chapter works with the Peruvian Government to provide this small village, Araypallpa, with a venturi device that will accurately and reliably sanitize water over a range of flow rates by dispensing chlorine. Through the use of research, modeling, prototyping, testing and analysis, the current system is modified to increase the accuracy. By moving the device before the reservoir, the 30-minute World Health Organization requirement is met. The venturi system will accurately dispense chlorine for flow rates of 3-10 L/min to meet drinking water standards of 0.3-1.0 mg/L free residual chlorine, by adding 4.4 ± 2.6 mg/L of active chlorine, a $\pm 59\%$ available range of error. Repeatable tests show the linear region of the venturi's chlorine solution flow to the mainline flow ratio (M/Q) is 0.128 ± 0.014 , with an 11% error, well within the $\pm 59\%$ available error. This device will provide many developing areas with a cheap, safe and reliable water source.

Universal Screening

A. Bahgdassarian, L. Wilk

E. Dowdy - Gevirtz Graduate School of Education

Approximately 20% of school-age children in the U.S. experience emotional or behavioral problems severe enough to qualify for a psychiatric diagnosis (United States Department of Health and Human Services, 1999). While research suggests that early intervention is crucial in mitigating negative outcomes associated with emotional and behavioral problems, the current approach is to wait until problems significantly impair a child's functioning before intervening (Albers, Glover, & Kratochwill, 2007; Dickson & Bursuck, 1999). School-based universal screening for emotional and behavioral problems has been suggested as one way to identify problems early and guide interventions (Levitt, Saka, Romanelli, & Hoagwood, 2007). Empirical support for the utility of universal screening is growing; however, more research is needed to determine the efficacy of specific screening tools (Levitt et al., 2007). Data is currently being collected to provide valid evidence for a newly developed, multi-informant behavioral and emotional screener—Universal Screening for Emotional and Behavioral Problems both at an Elementary and a Middle School. This study, known as The Behavioral Assessment System for Children,

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Behavioral and Emotional Screening System (BESS), will provide preliminary results from a universal screening, in which all children at one elementary and one middle school (963 children total) were screened using student and teacher versions of the BESS. Results will highlight the percentage of children who screened at “elevated” or “extremely elevated” risk. In particular, differences between males and females will be presented. Additionally, to examine the similarity of ratings of the same child by different raters (teacher, student), inter-rater reliability estimates will be provided. Implications and practical considerations will be explored.

Distribution of the Sand Crab Parasite, *P. altmani*

K. Bruccheri, L. Van Woy

M. Page – Marine Science Institute

The distribution of the parasite, *Profilicollis altmani*, on the sand crab, *Emerita analoga*, was examined. Sand crab specimens were collected at three sandy beaches along the California coastline and analyzed for the relationship between the size of the sand crab and the intensity of parasitism. The data was then compared to the relative numbers of *P. altmani* on female and male *E. analoga*. Findings showed that female sand crabs had more parasites than male sand crabs, with an aggregated distribution of *P. altmani* ($x=4.23$; $s^2=12.98$), while the males had a random distribution of *P. altmani* ($x=0.51$; $s^2=0.53$). Females tended to be larger than male sand crabs, thus supporting the hypothesis that there is a positive correlation between parasitism sand crab size. This relationship is mostly likely due to an increase in hindgut volume with increasing size class. The increased metabolic rate of *E. analoga* in colder waters provides further evidence that there is an increase in size class with a corresponding increase in latitude.

UCSB Supermilage Car

C. Carreon, S. Handa, B. Kagy, V. Kolev, A. Rosenblatt

E. Matthys - Mechanical Engineering

Few projects exemplify UCSB's core belief in applied research and environmental responsibility better than the supermileage vehicle project. Born only 4 years ago, the UCSB supermileage car is becoming a worthy competitor in the annual Shell Eco-Marathon Competition, where the vehicle with the best miles per gallon wins. This year our vehicle successfully completed runs for the first time in 2 years, obtaining a fuel consumption rating of 735 MPG. When initially deciding which one aspect of the vehicle would most improve vehicle efficiency and reliability, the gearbox was chosen—not only due to its destruction during last year's competition, but because the old design was inefficient, sluggish and created large internal moments. This presented a great chance to reduce rolling resistance. The gearbox was designed to keep the previously specified output ratio, allowing us to maintain last year's optimized tuning. The gearbox was modeled using CAD software, then prototyped and fabricated using classic and CNC mills respectively. Tests were done to gain a sense of gearbox resistance and short term reliability.

Ripped Off

S. Cho, S. Kang

L. Parks - Film and Media Studies

Beginning of the Fall 2009 quarter, Sarah Cho and I were struck by the marked difference in the UCSB registration process. A sense of panic overtook the student body as people desperate to fill graduation requirements volleyed with each other to obtain the few available class slots. In this short-form documentary, Sarah and I aimed to explain the UC budget crisis in a non-partisan way to the UC student body, specifically targeting those not actively involved in the grassroots protest movement. Reflecting the trends of the online culture that I, myself, am embroiled in, we constructed a multimedia piece which pulls and manipulates source material from both historical and pop culture sources. Using graphics and irreverent voice over, the film takes a critical approach to the mainstream discourse of the UC budget crisis, while educating and encouraging further personal exploration. The film was created during the Fall 2009 and Winter 2010 quarters with the help

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of an all-student crew. Sarah Cho acted as the producer while Se Young Kang wrote and directed. The final product premiered with 3 other student short films at IV Theater. In the coming years, we will submit it to film festivals and hope to host free screenings at other UC campuses.

Exploring Patterns in Crab Recruitment and Oceanographic Processes Along a Mid-Latitude Island in the Eastern Pacific

L. Cole, A. Ennis

J. Casselle – Marine Science Institute

For decades, marine invertebrate recruitment in the Santa Barbara Channel and Southern California Bight has been the subject of numerous dissertations, publications, and ongoing monitoring efforts (Broitman 2008, Ebert 1994, and Morgan 2009). The goal of this research is to investigate the spatial and temporal distribution of crab juveniles and megalopae with regards to physical oceanographic processes. Local population dynamics and community structure have been found to have direct effects at nearby subtidal rocky reefs. This monitoring effort is comprised of a series of replicate sites along the coastline of a single island, which represents a scale of subtidal collection not yet attempted at the Channel Islands. The sites were visited every two weeks for a sevenmonth period starting in April and ending in September of 2008. A total of nine sites were sampled, with three replicate moorings per site, resulting in a total of fifty-four subtidal larval recruitment collectors or brushes being collected and deployed for each two week period. The brushes were then cleaned of their contents in the lab, invertebrates were identified, removed, and archived. The crab samples are composed of several species of rock crabs, kelp crabs, and shore crabs, which have commercial and ecological importance. Patterns of crab recruitment are strongly correlated with observed fluctuations in sea temperature at the site scale, with regional upwelling events, and tidal fluctuations.

Clinical Aspects of the Neuropsychological Process

R. Espinoza, K. Norman

S. Smith – Gevirtz Graduate School of Education

Although feedback is described as an important aspect of clinical assessment, it has only received attention in personality assessment research. To date, the role of feedback in neuropsychological assessment remains relatively unexplored. Despite claims that assessment feedback is beneficial both for the client and the therapeutic relationship (Smith, Wiggins, & Gorske, 2007), there have been no experiential research studies examining the effects of this frequent clinical practice. The purpose of this study is to investigate the benefits of sharing brief neuropsychological assessment feedback in a nonclinical population. Participants were assigned to receive or not receive feedback on their test performance. Results suggest that participants experienced significantly greater alliance with the assessor, well-being, and satisfaction with the neuropsychological assessment process after receiving feedback about their performance. These results support findings from the personality assessment literature regarding the benefits of receiving assessment feedback, and validate a Collaborative Therapeutic Neuropsychological Assessment approach.

Postnatal Brain Growth and Autism

D. Gordon, Z. Flood

S. Janusonis - Psychology

A number of studies have shown that perturbations of the serotonin (5-hydroxytryptamine) system may result in various brain abnormalities in autism spectrum disorders (ASDs). Several brain structures in the autistic brain show accelerated growth during the first years after birth, but the biological causes of these alterations remain unknown. We hypothesized that these abnormal growth patterns may be caused by changes in the serotonin synthesis rate. In order to investigate this problem experimentally, we took advantage of a recently discovered single-nucleotide polymorphism (SNP) in the mouse gene that codes tryptophan hydroxylase 2 (Tph2), a rate-limiting enzyme in the brain serotonin synthesis pathway. By using microscopy and high-precision 3D-reconstruction from serial brain sections, we tracked the volumes of several forebrain

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structures in three mouse strains (CD-1, C57Bl/6, and BALB/c) that carry different functional Tph2 versions. The data were analyzed at postnatal days (PD) 3, 7, and 14. We also used serotonin transporter immunohistochemistry to assess the density of serotonergic fibers in the brain of the three strains. Our preliminary data indicate that the density of serotonergic fibers is lower in the hippocampus of the BALB/c (low serotonin synthesis) strain compared to the other two (high serotonin synthesis) strains. Interestingly, we found no statistical difference in the hippocampal volumes of the three strains at PD14, suggesting that the final size of the hippocampus is relatively insensitive to developmental serotonergic signals. We are currently examining the growth of the hippocampus and other forebrain structures at the earlier developmental times (PD3 and PD7).

Identifying the Fate of Dissolved CH₄

C. Hansen, A. Terry, A. Watros

F. Kinnaman, D. Valentine - Earth Science

Previous studies have defined the major inputs and features of dissolved methane in the Santa Barbara Basin. Further aspects of the mid-water and shallow methane plumes are investigated here by analysis of samples collected on the SEEPS 2009 research cruise and via comparison to previously reported work. We find substantial dissolved methane plumes at the surface and at 200 meters deep that transit from hydrocarbon seeps in the Santa Barbara Basin towards the Point Conception area. Non-methane hydrocarbon (ethane and propane) concentrations are also used to trace the transport and fate of the various methane plumes. Samples from waters to the south of the Channel Islands contain methane in concentrations well above atmospheric equilibrium. These results contribute towards a methane budget for the Southern CA Bight region and suggest that ocean waters effectively prevent seep methane from reaching the atmosphere.

Through the Wasteland

K. Kinghorn, M. Orozco

M. Kingsley - Theater and Dance

For our Senior Honors Project, we have blended our two separate academic interests of English Literature and Philosophy to present an evening of dance work based on T.S. Eliot's 1922 modernist poem "The Waste Land". The language, concepts, themes, and visuals presented in "The Waste Land" will all be used as our main source. Although this text presents many different narratives and disjointed ideas, we have created one unified conceptual work, which ultimately depicts an abstract journey of the main character. To take this work from conception to reality, we held open auditions in January 2010 which resulted in our final cast of eight dancers,—seven women and one male. Our lead male dancer, Pavel Zavarzina, is a junior BFA dance major and portrays our main character who navigates an abstract journey through past memories and premonitions of his own death. In parallel with the themes of "The Waste Land", we have created Pavel's character as a war soldier who holds anti-violence sentiments throughout the piece. In complement, the seven women dancers join Pavel to present his memories of life before his death. We anticipate the audience will relate and understand the journey of Pavel's character, as well as experience the depth and beauty of T.S. Eliot's poem.

Wireless Glucose Monitoring System

D. Morton, N. Pourian

L. Theogarajan - Electrical Engineering

Currently it is estimated that approximately 180 million people around the world are suffering from diabetes. Because of the importance of reliable and fast blood sugar monitoring for diabetes, the development of an effective glucose monitoring system has been a subject of concern for decades. Diabetics who use insulin, need to monitor their blood sugar level more often, both to assess the effectiveness of their prior insulin dose and to help determine their next insulin dose. Consequently, having an effective continuous monitoring system which could read glucose levels and dispense insulin when necessary is a great benefit. Since required insulin dosage also depends on patient activity, we are designing a system that can

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also detect a patient's activity allowing a more accurate reading of glucose levels. This involves sensing heart rate, blood pressure, motion, skin resistance, and temperature in a small form factor. The device can then reside in a small wristband and transmit data wirelessly to the pump or to doctors who are monitoring the patient. We believe a successful implementation would allow diabetics to lead a life with more personal freedom.

Inactivation of the Dorsal Raphé Nucleus Reduces the Anxiogenic Response of Rats Running an Alley for Intravenous Cocaine

C. Mueller, O.A. Ofer

A. Ettenberg - Psychology

In addition to its well-known euphoric properties, cocaine has been shown to have strong negative effects whose onset occurs after the initial euphoria has subsided. These dual and opposing actions of cocaine can be observed in rats running a straight alley once a day for a reward of IV cocaine. Such animals exhibit a unique pattern of approach-avoidance conflict - they run quickly toward the goal box, but then stop and retreat back to the start box. Previous research has shown that "retreat behaviors" stem from the subjects' concurrent positive (cocaine reward) and negative (cocaine-induced anxiety) associations with the goal box. Since brain serotonergic (5-HT) systems have been implicated in the neurobiology of anxiety, the current study investigated the impact of inactivating the 5-HT system on the retreat behaviors of cocaine-seeking rats. Intracranial application of baclofen and muscimol (GABA agonists) into the cell bodies of origin of the 5-HT system (the dorsal Raphé nuclei) had no impact on the subjects' latency to leave the start box but reliably reduced retreats and thereby improved times to reach the goal box. These data demonstrate that inactivation of the 5-HT system reduces the conflict/anxiety otherwise present in cocaine-seeking animals.

My Last Day

D. Reik, A. Smith

J. Holt - Film and Media Studies

"My Last Day" is a student film made for the Film and Media Studies 106 class. This project pushed the limits of student filmmaking at UCSB. Its complex plot, action sequences and use of both older and SAG actors, make it one of the most ambitious films ever embarked upon and successfully completed at UCSB. The film was screened in IV Theater on March 19, 2010 and was received positively. "My Last Day" enabled the students involved to work with professional actors and industry professionals resulting in a product dramatically different than most student films. The purpose of "My Last Day" was to challenge students to make a superior film highlighting the abilities of all those involved. The film's success gave students the opportunity to showcase the skills they have been honing and really display all they have to offer.

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The University Of California Student Fee Increases

J. Aleman-Tovar

D. Casillas - Chicana and Chicano Studies

The ongoing University of California student fee increases have created quite a stir amongst the 191,000 UC students. Student fees have increased \$4,372 or 139% in the past decade 2000-2010. If student fee increases continue to occur at this pace, by 2020 undergraduates will be paying approximately \$18,246 per year. The importance of an affordable education is extremely important, Therefore this research will attempt to answer the following question: What are the primary factors influencing student fee increases at the University of California? The research will be divided into four sections. Each section will thoroughly analyze sources, which could possibly have lead to the rise in student fees over the past decade. The first section will clearly define and analyze the term 'student fees' as described in "A Master Plan for Higher Education in California", published in 1969, and will use also reference current sources such as the UC website(<http://www.universityof-california.edu>). The second section will focus on California's state budget in regards to the University of California. How has the allocated budget for the UC changed within the past decade? The third section examines the percentage of state contributions to the University of California and will demonstrate the small percentage of state funding for the UC. If the state's contribution is relatively small but not decreasing, what is causing the the increasing student fees? This research will attempt to find a reasonable solution to the problem of continuous fee increases.

The Best Little Army in Asia

A. Alvarado

J. Talbott - History

Historical writing on the Korean War has neglected the South Korean army, commonly referred to as the ROK Army). Usually it has been portrayed as corrupt, demoralized, and bound to fail. My thesis challenges this idea. I show how the Korean Military Advisory Group (KMAG), an American agency established in South Korea in the aftermath of World War II, tried to shape the ROK Army. My thesis draws on sources in the US Army Heritage and Edu-

cation Center, as well as the memoirs, books, and papers of important actors. The history of the relationship between KMAG, the South Korean government, and the ROK Army is a history of unintended consequences. The failure of American policy in South Korea, I argue, contributed greatly to the failures of the ROK Army when war erupted, in the summer of 1950.

McCharterization of Public Schools in Harlem, NY

L. Arévalo

M. Callahan - Chicana and Chicano Studies

The New York City public school system serves the largest population of students from historically underrepresented communities in the United States. In 2002, the New York State Legislature passed the Schools Governance Law that introduced the most controversial experiment in education to date, giving Mayor Michael Bloomberg control of the Department of Education. This legislation reversed the Ocean Hill-Brownsville decision of 1969 that decentralized school governance into 32 school districts. This study investigates how mayoral control of public education created opportunities for charter schools and privatization. I examine how Family Academy (P.S. 241) in Harlem, fought to maintain its existence against the Department of Education's plans to replace it with a charter school. The development of Harlem Success Academy 4, a charter school, reveals the complications of unequal access in the current education crisis. With the role of government in the public sector declining and the opening of new markets in education by neoliberals, this paper highlights how communities dedicated to perserving quality public education are undermined, providing a sobering analysis of the "McCharterization" of public education.

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Using Community-Based Participatory Research to Develop Transgender Community Interventions

T. Avellar

T. Israel – Gevirtz Graduate School of Education

“Using Community-Based Participatory Research to Develop Transgender Community Interventions” was a multi-phase community-based participatory research project within Santa Barbara County’s transgender communities. This project was an extension of Dr. Tania Israel’s research team’s larger project, “Using Community-Based Participatory Research to Develop LGBT Community Interventions.” The first phase consisted of an online survey that assessed community assets and risks. In an effort to reach economically and socially disadvantaged populations, a paper-and-pen version of the same survey was created. Through active engagement of established community groups and organizations, an ample and diverse participant pool was reached. The second phase of this project engaged transgender community members via community forums to interpret survey results and to envision interventions to meet the needs of community members. The third phase involved qualitative analysis of forum transcripts using line-by-line coding, identification of themes by team consensus, and summarization of codes related to each theme. Various themes such as experiences of discrimination and harassment, inner-group fragmentation, and a lack of social avenues and networks were evident. This project will account for those themes as well as the possible solutions that community members have proposed.

Microfluidic Droplet Actuation for Cell Sorting

C. Axline

A. Cleland- Physics

Cell sorting is a challenge of great interest to medical and biological research. The process identifies constituents of a diverse cell population; it has been applied to track diseases, follow cancer growth, or gather adult stem cells. Modern methods of cell sorting, specifically Fluorescence-Activated Cell Sorting, require unwieldy, expensive optical equipment. Microfluidics, coupled with all-electronic identification methods, expand the number of cell types

that can be sorted simultaneously while reducing cost and size. The design evaluated here employs fluid droplets, which are intended to capture and sort cells. Microfluidic T-junction and flow-focusing designs are used to generate and charge droplets, which are subsequently deflected by a constant electric field. We characterize optimal water droplet formation conditions and differentiate two electric force regimes: Coulomb and dielectrophoresis. Preliminary results indicate that this design has the potential to produce compact, versatile cell sorting devices.

Faulkner and the Wild Natural Wor(l)d

C. Badley

C. Waid - English

“Faulkner and the Wild Natural Wor(l)d” examines the works of American novelist William Faulkner via intersections of environmental and psychoanalytic literary criticism. Concerned with notions of the body, the ego, and the natural world, the paper will focus on how the text changes when confronted with the natural world. Divided into three portions – Nature and the Artist, Nature and the Child, and Nature and God – it will analyze the ways in which boundaries between the external and internal world cease, leading to other binaries (male/female, White/Black, thought/speech) to be reexamined as well. It will draw upon a variety of sources – currently, it focuses on novels, short stories (collected and uncollected as well as published and unpublished), personal writings, and the original manuscripts at the University of Virginia Special Collections Library. Because it unites environmental and psychoanalytic literary methodology, the paper finds itself in a particular niche in Faulkner criticism – I am working within the tradition of one (psychoanalytic) while developing the other (environmentalism). The paper anticipates the natural wor(l)d being one that is contested throughout the rest of the works; there is a schism between the natural world/word and what follows – in journeying from the natural world, binaries and social constructs (in particular, race, sexuality, and language) begin to complicate and challenge what was found in nature. Because the paper is still being written, it may continue to evolve as is called for by the findings in the texts.

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Colonial Mentality and Filipino American Families

S. Barquin

C. Conoley – Gevirtz Graduate School of Education

Research has shown a link between poor family relationships and emotional distress, delinquency, and substance abuse in Filipino youth. Poor family relationships within the Filipino population may be influenced by the presence of colonial mentality. It is characterized by perceived inferiority and rejection of Filipino identity and “uncritical preference for anything American” (David & Okazaki, 2006). The purpose of the present study is to examine factors impacting the parent-child relationship and psychological health in Filipino Americans. Preliminary results show moderate to strong positive correlations between colonial mentality variables and family conflict.

The Ethnographic Study of a Queer Latino Bar

J. Barragan

H. Roque Ramirez - Chicana and Chicano Studies

In 1967 police raided a gay bar, attacked the customers and owner, arresting sixteen people. This raid sparked the fuse for mass demonstrations in what became the largest national gay rights movement recorded until then. Today the space that the City of Los Angeles has recently designated as a historic monument is called “Le Barcito”, a queer Latino bar located in the Silver Lake district of Los Angeles. Bars are places of leisure, often becoming sanctuaries for marginalized groups. This research project develops through interviews and ethnographic methods a discussion of space and the role of Le Barcito plays in a community. I begin by describing a typical visit to Le Barcito to understand the physicality of the bar followed by a discussion of the clientele to understand community building. Lastly, I offer a brief history of Le Barcito to understand the legacy it has to support marginalized communities.

Myself, Right Now: Queer Identity Development

A. Bartlow

S. Falasca-Zamponi - Sociology

The period spanning from high school to college is a time of enormous personal growth and identity development for all individuals. To those who identify as gay, lesbian, bisexual, transgendered, or transsexual, however, this time presents unique challenges and opportunities for defining and affirming one's identity. Through in-depth interviews with university students, this research explores the issue of queer identity development, and argues that it is a fluid process that is significantly affected by a student's environment. The study shows that high schools' hetero-normative environment limits students' self-exploration; while many students are aware of having homosexual desires, they simply ignore and deny them. Upon joining the more liberal, open, and queer-friendly culture of university life, however, self-exploration and queer identity development occur more naturally among the youth. The findings suggest that work should be done on high school campuses to build an environment that encourages self-exploration and identity development for young queer students. Queer-positive events and clubs, including Gay Straight Alliances, could help students feel safe to explore their own identities at a younger age, thus resulting in less denial and shame.

Hydrocarbon Seeps and Microbe Communities

A Baxter

S. Bagby, D. Valentine - Earth Science

Off the coast of Isla Vista, a curious phenomenon takes place in the sediment of the ocean floor. Upwellings of hydrocarbons such as petroleum and methane seep through the rocks, and diffuse through the atmosphere, and contribute to the levels of greenhouse gases. To begin understanding the intricacies of this extreme environment, we have examined over 5,000 images taken by the remotely operated sub, Sentry. By analyzing these snapshots and compiling them into a spreadsheet, we have begun to put together a cohesive picture of sediments, vents, and anaerobic microbial “mats” that make up the

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sea floor. These microbes feed on hydrocarbons, and are partially responsible for stopping a significant portion of the methane released from the sediment from reaching the atmosphere where they would contribute to the levels of greenhouse gases. Similarly, a second set of images were analyzed from a permafrost region where gases such as methane are frozen in ice. As the methane freezes and expands it forms what are referred to as pingos, or areas of sediment that have buckled to form mounds. As with the first set of images, those collected from the permafrost region were analyzed and points of interested tabulated in a spreadsheet, noting the pingos, and the microbes and macro-fauna that can be found around them. By obtaining detailed information about these two sites we can begin to understand the role that the ocean ecosystem plays in the complex global methane cycle, a main component of the debate on global warming.

Mass Spectroscopy in the Analysis of Art

J. Bedford

M. de Vries - Chemistry and Biochemistry

In art, paints that may be the same color might have different chemical compositions. The different types of paints used may be traced to specific geological locations, time periods or techniques. Thus, analyzing pigment molecules in works of art can provide this information. However, analyzing historically significant objects often necessitates sampling the artwork, which is destructive. Minimally invasive analysis of historical works of art requires working with small sample sizes. In the case of paint, concentrations of analyte pigment molecules are even lower due to the presence of other compounds such as binders and adhesives. This creates a problem when using traditional chromatography methods. We propose that resonance enhanced two photon ionization mass spectroscopy (R2PI-MS) is uniquely suited for the quantitative analysis of pigment molecules in art. We expect that R2PI-MS will have detection limits considerably lower than conventional chromatography methods. We will use laccaic acid, a red pigment molecule as a model system in exploring detection limits. We will test our model system by mixing known quantities of laccaic acid with common paint binder and adhesive molecules. We hope to establish detection limits orders of magnitude better than conventional chromatography methods, allowing us to develop and optimize this quantitative technique for the analysis of art.

Assessing Eutrophication in the UCSB Lagoon

N. Bobco

C. Carlson - Ecology, Evolution, and Marine Biology

Bacterioplankton are major biogeochemical agents in aquatic ecosystems and process 30-90% of daily primary production in the surface waters of marine systems. Their dynamics control the consumption of dissolved organic matter, consumption of oxygen and remineralization of organic matter back to inorganic constituents. In highly eutrophied systems bacterioplankton production in response to organic nutrient loading can lead to hypoxic or anoxic conditions. The objective of this study was to gain a better understanding of the bacterioplankton dynamics and how it correlated to the dissolved oxygen and physical factors such as temperature and salinity. Water samples were collected from five different sites around the lagoon at surface and at bottom depth. Bacterio abundance was determined via epifluorescence microscopy. The results of bacterioplankton dynamics will be discussed in the context of oxygen dynamics and influence of tides and lagoon flushing. Obtaining the approximate abundance of bacteria at surface, at depth, and over time along with corresponding readings will provide a baseline time series for future studies that might examine eutrophication in the UCSB lagoon.

African-American Education and Critical Pedagogy

P. Boone

C. Woods - Black Studies

Coined in 1983 by Henry Giroux, "critical pedagogy" has become an important method of inquiry through which to consider African-American education. "Critical pedagogy offers an articulation of the pedagogical practices of educators committed to the elimination of social inequality" (Theory of Resistance, Henry Giroux 1983). Confidence and performances levels of African-American students can be examined through study of relevant curriculum. This research analyzes the discourse which has engaged both scholars and students on this topic. The project outlines scholarship focused primarily on possible barriers that affect the academic success of African-American students.

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Already explored in this research literature: the impact of critical pedagogy, the role of unqualified teachers, curriculum tracking, Black Cultural and Historical Studies, and the student-teacher relationship. All of these aforementioned aspects of education play a significant role in the success and failure of students. However, in reference to the African-American community, it is crucial to examine how their culture and experiences may cause them to view and interpret knowledge differently than students of differing backgrounds. Utilizing a "critical pedagogy" framework, this research seeks to delineate how and under what conditions the curriculum recognizes and nurtures what is likely an identifiable learning trajectory; an acknowledgment which is important to the confidence of African-American students and their educational motivations.

You Never Drink Alone

K. Buerner

R. Rice - Communication

Approximately 63% of full-time college students reported drinking alcohol recently, 43% reported recent binge drinking, and 18% of students in college meet the criteria for alcohol abuse and/or dependence (Mothers Against Drunk Driving; Talbott, Martin, Usdan, Leeper, Umstattd, Creemens, et al., 2008). Alcohol consumption is a salient and serious issue on college campuses across the country as shown in popular media and scholarly literature. This study reviews relevant research to develop and test a model of the influence of communicative (family communication, peer norms, peer influence, and on-campus alcohol campaigns), and contextual (prior experience with alcohol, demographics, current residence, and year in school) factors on college students' attitudes toward, and reported behaviors of, alcohol consumption. The sample included 427 undergraduate students from lower and upper-division Communication courses who were recruited to voluntarily participate in a brief online survey for class credit. Hypotheses were developed concerning communication about alcohol, the influence of other students, experience with alcohol, and exposure to anti-alcohol campaigns on-campus. It is predicted that these variables will affect current drinking behaviors and attitudes towards alcohol.

Testing Methods for Electricity Generation Devices

C. Buhler

J. Bowers - Electrical and Computer Engineering

Under the direction of Professor John Bowers in the Optoelectronics Group in the College of Engineering, I have been learning measurement and analysis methods for testing the efficiency of thermoelectric devices and multi-junction solar cells, both of which can be used to generate electricity. I learned how to determine carrier density, quantum efficiency, Hall coefficient, and Seebeck coefficient for a thermoelectric sample. After enough samples were tested, I was able to draw basic conclusions about the efficiency based on the physical, chemical, and electrical properties. Thermoelectric devices produce electricity when a temperature change is put across them or conversely, produce heating or cooling when a voltage change is put across them. A common application of thermoelectric devices is heating used for seat warmers in luxury cars. In the Optoelectronics Group, we are trying to design high efficiency thermoelectric devices that are capable of generating electricity from small heat differences. I have been testing a wide variety of samples that the graduate students fabricate for all the values listed above. By doing so, I am gaining an intuition for the chemical and physical properties of the devices and can deduce efficiencies based on these properties.

Attitudes and Perceptions of Mental Health Among Black/African American UCSB Students

S. Bullitt

H. Kim - Psychology

Culture has been found to be an important variable in understanding how various ethnic groups seek support and engage in different forms of health behavior (Kim et al, 2008; Thompson & Chambers, 2000; Parham, 1999). According to the Student Mental Health Report 2006, conducted by the University of California system wide, mental health issues have become more severe among UCSB students. Racially/ethnically under-represented students are a high risk population subject to negative mental health experiences. (Dimsdale & Young 2006). However, this stu-

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dent health report is limited and does not provide a racial or ethnic breakdown of UCSB students who access mental health services. According to the mental health professionals at UCSB, very few Black/African-American students use the services. This study qualitatively and quantitatively examines beliefs held in regards to mental health and utilization of mental health services by Black/African American UCSB students enrolled during the 2008/09 academic year. Two focus groups were conducted with semi-structured questions. Participants discussed their experiences and ideas regarding mental health and on-campus services. An abridged 92-question survey, borrowed from the survey on "Interpersonal Relationships of University Students" (Hashimoto and Kim, 2008), was also given to participants. The abridged questionnaire surveys the topics of social support, coping strategies, and seeking professional help. Data collected will enhance the existing data in the Student Mental Health Report 2006, provide recommendations to better assist underrepresented UCSB students, and contribute to social science knowledge on cultural assumptions of help-seeking behavior.

Infrared and Millimeter Correlation

N. Carroll

P. Lubin - Physics

Atmospheric water vapor poses a significant problem in studying incoming infrared and microwave radiation. Water vapor absorbs and emits light strongly in both of these wavelengths, and so it interferes with our observations of incoming radiation. Unlike some atmospheric gases that absorb infrared emission, water vapor is not uniformly distributed, but clumps and varies in time and space. By continuously photographing the sky in the visible and infrared wavelengths, we can construct an atmospheric model of water vapor. Using this model and image processing software, we are able to reduce the water vapor interference from the infrared data. We can use these results to determine if there is a correlation between the effects of water vapor in the infrared and the microwave bands. If there is such a correlation, we will ultimately use the infrared band real-time data to correct ground-based telescopes that study radiation in the millimeter wavelength bands. In particular, this correlation can be used to help study radiation from the Cosmic Microwave Background. Additionally, an atmospheric model of water vapor fluctuations could have implications for research on the greenhouse effect and global warming.

New Materials for Organic Solar Cells

E. Chesnut

F. Wudl, M. Wang - Chemistry

This project explores new electron-accepting materials for organic solar cells. Specifically, it focuses on the synthesis of compounds that could be used for polymer solar energy conversion. The ultimate goal is to enhance the performance of organic solar devices. This project consists of two parts. The first area of investigation relates to the synthesis of bis-N-sulfinyl-9,9-didodecylfluorene-2,7-diamine, which was followed by a polymerization reaction to obtain a conjugated polymer consisting of 9,9-didodecylfluorene separated by -N=S=N- moieties. A model compound from dimerization of 2-N-sulfinyl-9,9-didodecylfluorene was also synthesized. The second part of the project involves the synthesis and characterization of fullerene derivatives in which an organic chromophore is connected to a specific position of a fullerene cage. The goal is to obtain new compounds with enhanced absorption of sunlight in the visible range, while maintaining good solubility of these molecules in organic solvents.

Self-affirmation and Relationships

A. Chorneau

N. Collins - Psychology

Self-esteem moderates how people respond to relationship threats. Low self-esteem individuals react to relationship-based threats to self by distancing from their partner; individuals with high self-esteem do not respond in this way. The current study examines whether or not a self-affirmation manipulation could attenuate the relationship-distancing effects exhibited by individuals with low self-esteem. Participants were exposed to either a relationship-based self-threat or the absence of such a threat, and then completed a self-affirmation or a control task. As predicted, self-esteem moderated the effect of self-affirmation. Individuals with low self-esteem when presented with a self-threat distanced themselves from their partners. This effect was reduced (or eliminated) if they were given the opportunity to self-affirm. By contrast, there was no impact of the threat or affirmation among individuals with high self-esteem, who had similar outcomes across all four conditions. Results are discussed in terms of the implications for both self-affirmation theory and research examining romantic relationship processes.

Abstracts—Individual Projects

Migrant and Minority

W. Chou

S. Pandya - Asian American Studies

Previous literature has contended that certain ethnic minorities regard their racial status differently than others. For instance, African-Americans, some scholars argue, are more apt to interpret present inequalities as evidence of deliberate hostility from whites because of the historical persecution of blacks in the United States. On the other hand, ethnic groups with a large proportion of recent immigrants, such as Asian-Americans, are more likely to attribute discrimination to other obstacles, such as a lack of fluency in English, and believe that their children can gain acceptance from whites through education and hard work. This dichotomy is problematic in part because it assumes that the children of immigrants uniformly accept their parents' beliefs. Very little research, in particular, has focused on how the racial consciousnesses of second-generation Asian-American youth diverge from those of the first generation. In this paper, I explore how immigration, upbringing, and encounters with racism have shaped the perspectives of second-generation Asian-Americans toward race. Using in-depth interviews conducted with Asian-American college students, I argue that my respondents' views do not fit into any single pattern, but are instead diverse and complex.

Quantifying Interaction Strengths in Kelp Forests

J. Christie

D. Reed - Marine Science Institute

Subtidal Giant Kelp forests are one of the most productive systems in the world, and support the enormous diversity of fishes and invertebrates that thrive in the Santa Barbara Channel. Kelp is a primary producer that feeds herbivores, which in turn are eaten by predators higher up in the food chain. Many food webs have been constructed for the kelp forest ecosystem, but little is known about the strengths of the interactions between these organisms. My project will estimate the strength of the interactions between several herbivores and their algal prey in Giant Kelp forests. Additionally, I will compare these interaction strengths between long term research sites that have been cleared of all their

kelp (storm simulation sites) and sites that have been left alone (control sites). I expect to see altered food web dynamics in the storm simulation sites compared to the control sites. Where the kelp has been cleared, the herbivores that usually eat the kelp, such as urchins, will not have their food source. In the cleared sites, smaller understory algae will grow in the place of the absent kelp, and will sustain a different population of herbivores, such as turban snails. I expect to see kelp herbivores such as urchins being replaced by understory algae herbivores like turban snails, thus altering the normal interaction strengths of the kelp forest and changing food web dynamics.

Extended Intergroup Emotions

M. Cook

Diane Mackie - Psychology

Imagining intergroup contact has been shown to reduce prejudice; however, many studies have ignored potential mediators of this effect. Intergroup Emotions Theory suggests that contact-related emotions about the target group will mediate prejudice toward the stigmatized group. To test this hypothesis I gave 88 female undergraduates a picture of an outgroup (obese) or ingroup (normal weight) person and asked them to imagine one of the following: (a) merely meeting this person for the first time (b) experiencing admiration and respect for the person during the meeting (c) experiencing warmth and affection for the person during the meeting. I assessed prejudice toward obese people using an implicit reaction time based measure, rather than the direct measures used in prior research. The study failed to replicate the positive effects of imagined contact on prejudice, and the mediational effects of emotion were thus inconclusive. If imagined contact can in fact be established as reducing prejudice, future research could focus on the role of specific intergroup emotions in mediating this effect.

Abstracts—Individual Projects

Tau Degradation by Methylene Blue

M. Cornwell

K. Kosik – Molecular, Cellular, and Developmental Biology

Severe dementia from Alzheimer's Disease (AD) currently affects 5.3 million Americans and this number is expected to increase by 70% to 9.1 million by 2029. Alzheimer's is a neurodegenerative disease characterized by both intracellular neurofibrillary tangles (NFTs) and extracellular aggregates of beta-amyloid found within specific regions of the brain including the hippocampus, which is responsible for memory. In an Alzheimer's patient, hyperphosphorylated tau detaches from microtubules in the neuronal axon and accumulates within the cell, forming NFTs that cause neuron malfunction and eventual cell death. Developing a drug that would target these aggregates of tau could improve the lives of millions of Alzheimer's patients worldwide.

One candidate of interest is the phenothiazine methylene blue (MB) that has been shown to disintegrate tangles in vitro. To test the viability of this interaction in an in vivo model, we studied the effects of MB upon NFTs using a transgenic AD mouse model. Through intraperitoneal injection, we treated mice with different concentrations of MB daily for one week. We then collected the brain tissues and used fluorescent immunohistochemistry to detect NFTs in the hippocampus. Intriguingly, NFTs are observed in the hippocampus of untreated mice but rarely observed in the hippocampus of treated mice. In addition, the treated mice tend to display a diffuse pattern of staining in the hippocampus. The results of this study suggest that MB might be a viable treatment for the human disease. Quantification of the intensity of fluorescence in histological samples of treated and untreated mice is recommended.

The Mathematics of Superstring Theory

L. Cortes

E. Davie - Mathematics

Superstring Theory, or String Theory for short, is considered one of the most prominent unified field theories to date; it describes nature's forces with a single, all-encompassing, coherent framework. This framework provides a possible solution to what is arguably considered the biggest problem in physics: the incompatibility of quantum mechanics and Einstein's general theory of relativity. This project focuses on the mathematics that is used in String

Theory and the current research in the field. Mathematics allows physicists to understand the complex framework that String Theory provides. However, due to technological limitations this framework cannot be tested even in our most modern laboratories. Therefore, more mathematical research is needed to further the advancement of String Theory. This project examines the foundational literature in the field of mathematics and physics, specifically analyzing the mathematical setbacks presented to string theorists and how further mathematical research can serve as one step to corroborating or possibly falsifying String Theory. Corroborated evidence of String Theory would be a major advancement in the sciences in that it would provide a firm foundation from which to build our understanding of the world.

Unintended Consequences of Economic Sanctions

M. Cosic

C. Kaplan - Political Science

Sanctions as an instrument of foreign policy aim at avoiding military engagement. Yet, whether the imposition of economic and political costs results in the foreign policy goals being pursued is an under studied area. This study explores the effectiveness and theoretical basis for the use of sanctions by analyzing the case of Serbia and Montenegro. Although a few quantitative studies analyzing the effectiveness of sanctions exist, methodological questions have been raised regarding the causal logic and empirical evidence used. Aside from methodological issues, some scholars question the use of sanctions from a moral perspective, asserting that they disproportionately impact the most vulnerable civilian populations and thus cannot be considered a liberal alternative to the use of military force. The current study analyzes the assumptions made in the current literature on sanctions and the validity of many of the findings. This is done through examining the mechanisms which determine whether sanctions are effective, paying particular attention to the logical inferences drawn from aggregate empirical analysis and the inner workings of the mechanism of sanction effectiveness missing from aggregate research. In the analysis, evidence is drawn from economic data, public response to sanctions, elite struggle, and covert trade and financial assistance. Although the economic sanctions placed on Serbia and Montenegro resulted in negative consequences for the

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economy, they did not decisively contribute to ending the war in Bosnia or removing President Slobodan Milosevic from power. In actuality, the sanctions contributed to the rally-round-the-flag effect which in turn has impeded democratization and drastically reduced economic stability in the long run.

The Acoustics of Ideology: Sonic Experimentation in Godard's British Sounds

J. Cuellar

E. Branigan - Film and Media Studies

Filmmakers can use sound in targeted ways to generate particular effects. This research project examines the innovative use of sound to explore the ideological potentials within Jean-Luc Godard's film *British Sounds* (1970). Ideology, understood in the Althusserian sense, is a system of false ideas that in material practice, helps maintain the dominant hegemony by producing people obedient to the ruling class. This project analyzes the sound cues, sound space, the human voice, and the words of a voice-over narrator to show how Godard is able to estrange bourgeois spectators by conducting a class analysis of British society through sound. The film inverts conventional documentary style to expose capitalist power relations. *British Sounds* demonstrates that sound is an untapped aesthetic resource with the potential for prompting social change. Wavering between the aestheticization of politics and the politicization of aesthetics, Godard's work showcases sound as itself a form of ideology par excellence, to further the understanding of ideology as an all-encompassing (lived) experience. For Godard, the role of the filmmaker is to serve the working class in the struggle against bourgeois ideology and the social mechanisms of oppression.

Stimulant Discipline: Drugs, Labor, Identity and the Industrial Revolution

S. Cui

S. Cline - History

Mass consumption of stimulants and stimulant-like substances not only allows the process of industrialization to proceed on the basic level of worker functionality, but also acts as a technology of discipline in the service of domestic stability. The Industrial Revolution created new demands on labor. In response, workers meet these challenges by using stimulants. The stability needed by business is maintained through the creation of a docile workforce. Furthermore, the illegalization of particular substances justifies interventionist policies, facilitating capitalist expansion into foreign lands. These processes continually deepen industrialization. The exploration of substance use in recreational spaces combined with use in the work space will elucidate the way in which drugs promote worker morale. The overlap of drug use in these two areas functions both to psychologically and physiologically manipulate the workforce. Under such conditions, labor will be more amenable to the toleration of otherwise unacceptable conditions and compensation. Legal drugs and drug-like substances such as caffeine, nicotine, and sugar fulfill this role but illegal drugs also serve this function. Amphetamines and cocaine, while rejected in the mainstream, are promoted in counter-cultural circles. The utility of these substances to society is not completely discounted. They are tacitly accepted in some groups and their use is endemic in particular professions. This model explains the role of all psychoactive substances in modern industrialized society. Drugs have become an essential part of our identity and bind workers to the will of government drug laws. Understanding drugs in this capacity offers insight into the future of drug policy and carries implications for every person's personal relationship with psychoactive substances.

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Predictive Factors of Bystander Apathy on the Micro-Blogging Website Twitter

D. Danetra

C. Stohl - Communication

Social networking websites such as "Twitter" have become an integral part of our everyday lives. Often these websites prompt people to share personal information with potentially thousands of other users. Little research exists addressing the dynamics between on-line users and their reactions to and understanding of personal disclosures and communications of distress. In non-mediated contexts, experimental and field research has revealed that "bystander apathy" is often in evidence. People do not practice intervention even when they perceive another person is in trouble. The aim of this study is to explore the existence and extent of "bystander apathy" on "Twitter", and determine under what conditions such apathy occurs. Participants in this study were asked to determine the gender of the senders of 65 "tweets," which they believed to be ones taken from the real-time public "Twitter" feed. They were instructed to stop the experiment and inform the researcher if any problems arose. In actuality, the study was constructed of a pre-determined script of 65 "tweets," in which five of these "tweets" indicated that the person posting was in distress. The operating, dependent variable here was the participant's demonstrated willingness to recognize and notify the researcher of this distress posting. Further, several conditions were explored by manipulating the distressed "tweeter's" gender and social category. The reaction of the participants to the distressed "tweets" and their rationale for intervening or not intervening were collected through open-ended survey questions. Upon completion of the experiment, participants were informed of the purpose of the study and assured that there was no one in any actual distress.

Bunnyboy

H. Daniels

J. Apodaca - Film and Media Studies

My project, "Bunnyboy" was written as a senior thesis project for the Film and Media Studies department. The film, a surrealist romantic comedy, was designed to be shot as a mixed media film for the purpose of experimenting with

different types of media and how the interaction between film and digital can be used to create a more emotionally resonant narrative. Between October 2009, and March 2010, the crew I assembled shot, edited, and provided music and animation for the film resulting in a 20 minute short that screened to a crowd of 550 on March 19, 2010.

Divorce in Black Families

S. Davis

T. Afifi - Communication

Divorce in the United States remains a major social problem that is increasing across cultures. Despite extensive research on a range of topics regarding divorce, there are limited studies examining experiences of divorce on a micro-level in collectivistic cultures (meaning cultures that value the goal of the collective over goals of the individual for example African-American, Asian/Pacific Islander, and Latino communities). This study utilizes a grounded theory approach to holistically understand the divorce experiences of African-American families and possible influences from the African-American culture. Data was collected using semi-structured interviews, sampling a parent or adolescent who experienced separation/ divorce. The gathered data suggests that the African-American culture has an effect upon the reasons for spousal separation/divorce as well as the communication strategies used by spouses when discussing the divorce to children and extended family.

Uncivilized and Idealized: Depictions of the Southern Italian Peasant in the Fascist Period

E. Dickson

E. Rappaport - History, C. Fogu - French & Italian

This paper explores varying representations of southern Italian peasants during the fascist period through a combined study of Mussolini's speeches, government propaganda, and literature. By looking at the history of the Southern Question, that debated the perceived differences of the southern population, and the fascist rural campaigns, it can be seen that while agrarianism was glorified during the fascist period, liberal-era ideas of the south were still present. The carry over of liberal thought

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is especially noticeable in literature, in which both fascist and anti-fascist writers represented the peasants in similar modes to either support or criticize the regime. The fascist government, with its southern influences, altered the Southern Question by venerating rural life. Nevertheless, pre-fascist cultural images of the south were still pervasive and underlay both the government's campaigns and the literature of the period.

Point Mutations in mGluR5 Produce Abnormalities in Accumbens Glutamate In vivo: Link to Cocaine Sensitivity.

R. Domingo

K. Szumlinski - Psychology

Previous research has indicated that the interactions between group 1 metabotropic glutamate receptors, specifically mGluR5, and Homer proteins may be involved in neuropsychiatric disorders, including psychosis, and addiction. To further investigate the mGluR5-Homer interaction in the regulation of brain and behavior, transgenic mice with T1123A and S1126A point mutations of important phosphorylation sites on the mGluR5 subtype of glutamate receptor (TS) were investigated. This mGluR5 mutant mouse exhibits a 50% reduction in Homer binding to the receptor. This study used various in vivo microdialysis approaches to compare the accumbens glutamate phenotype of wild-type (WT) and TS mice. The data presented and discussed in this article support the hypothesis that the increased behavioral sensitivity to cocaine exhibited by TS mice is related to anomalies in accumbens glutamate and further the role for mGluR5-Homer interactions in regulating glutamate transmission in vivo.

Novel Discoveries of Handedness in *C. elegans*

J. Downes

J. Rothman, B. Birsoy – Molecular, Cellular, and Developmental Biology

Males of the worm species *C. elegans* display a certain asymmetry in their mating behavior, much like the human handedness bias. Males have fan-shaped tails for mat-

ing which contain eighteen "rays," each with two sensory neurons used to sense the hermaphrodite's body and vulva during mating. The male lies on its side while moving backwards along the hermaphrodite's body and turns either left or right to go over or under the hermaphrodite's head or tail while feeling around with its tail. We found that in wild-type (N2) males, worms make more right turns than left turns on average, and the majority of worms appear to exhibit this "right-handed" turning behavior. Interestingly, we have also found that "handedness" among a population is diversely distributed with some worms strongly right or left-handed and others somewhere in the middle. I scored mating behavior for turn direction using N2s, a strain with reversal of internal organ asymmetry (gpa-16), and a strain with no programmed cell death (egl-1). In each of these populations I found results similar to those previously observed in N2 males. In scoring the gpa-16s, I wanted to observe whether a reversal of internal organ asymmetry brings a corresponding reversal in handedness behavior. The gpa-16s, including those showing a normal phenotype, still preferred right hand turns, leading to the conclusion that handedness in male turning behavior is independent of internal organ asymmetry and thus generated by a novel symmetry-breaking event. I am currently investigating the possible genetic and/or neurological causes of this behavior.

Optimal Stopping Problems in Finance

A. Dror

M. Ludkovski - Statistics and Applied Probability

We study an optimal stopping problem based on the difference between the Market and the individuals "measures" in Merton's Jump to Default model. We will use finite difference methods to plot "free boundaries" and will prove properties of this problem and relate it, for example, to other famous optimal stopping problems in Financial Mathematics like the American put option.

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Physiological Changes During Molt

V. Ellis

S. Rothstein – Ecology, Evolution, and Marine Biology

We investigated the effect of molt on three physiological parameters in a captive population of Brown-headed Cowbirds (*Molothrus ater*). We measured hematocrit, corticosterone levels, and bacteria-killing ability of blood plasma by drawing blood from the birds prior to, twice during, and twice after their molt from late July to early September 2009. We sampled about 30 birds with approximately equal numbers of each sex. Hematocrit and corticosterone dropped significantly during molt for males and females. Bacteria-killing also dropped significantly for both sexes during molt, but increased in males to pre-molt levels faster than in females. We did not find any significant relationships between molt effort (i.e. the total number of growing feathers), molt score, or molt rate and any of the three physiological parameters we measured. However, we do not know if that is because the physiological parameters show an "all-or-none" response or because we only sampled twice during molt.

Performing Hyper-Femininity Off and On the Pitch

A. Engleman

B. Tomlinson – Feminist Studies

This ethnographic research project examines the gender performance of the UCSB women's rugby program and how the sport of rugby, its culture, and the stereotypes assigned to female rugby players shape such performances. It also interrogates how players form and negotiate their gender and explores how stereotypes assigned to female athletes as well as expectations of teammates and alumni police players' performances. I engaged in complete participant observation at practices, games, and socials where I took field notes. I conducted tape recorded, face to face, open-ended interviews with current players and alumni to understand the ways in which they perceive their own gender performances and what they think influences such performances. My field notes and notes from interviews serve as evidence. On the basis of this evidence, I argue that the UCSB women's rugby team, in contrast to many college teams, presents an overall "hyper-feminine"

gender performance that is constructed around the term "pretty," and the accompanying emphasis on heteronormativity. The team utilizes the term "pretty" as part of a self-description used to deconstruct the stereotypical butch image often applied to female athletes participating in rough, contact sports. Their hyper-femininity, partly emerging from UCSB's beachfront location, serves to establish a positive team atmosphere and discourse that creates solidarity among teammates.

Breaking the Law: The Efficacy of Okun's Law

H. Faquiryan

P. Kuhn – Economics

Okun's Law (OL) is an empirical regularity of national economies first hypothesized by Arthur Okun in 1962. The main component of OL is the relationship between fluctuations in economic output and employment. For the American economy, OL postulates that a 3% increase in output (GDP or GNI) will result in a 1% decrease in the national unemployment rate. The stability of OL though time is remarkable, but recent events of the business cycle have caused a "breaking" of OL in which robust recoveries in output are not coupled with robust recoveries in the labor market. Our hypothesis contends that above average productivity growth leads to such "breaking" of Okun's Law. We test this hypothesis using national accounts data from the World Bank, Bureau of Economic Analysis, Bureau of Labor Statistics, and the Organization for Economic Cooperation and Development for the economies of Canada, France, Japan, the United Kingdom, and the United States. We then run a series of specified regression models in order to test the statistical significance of the effect of productivity growth on the national unemployment rate. Our conclusion is that above average productivity growth is not the cause of the "breaking" of Okun's Law, and perhaps no single factor can cause this result. This conclusion implies a compositional evolution of modern national economies that differ from the national economies of the post-war era.

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Pal Norte: A Study of Musical Anthems Produced During the 2006 Immigrant Rights Marches

J. Ferrada

D. Casillas - Chicana and Chicano Studies

This research project investigates Latino music produced post-2006 in response to the 2006 Immigrant Marches that protested the HR 4437 bill. The bill aimed to criminalize organizations assisting undocumented immigrants. The Act also proposed to allow state and local law enforcement agencies to enforce stricter immigration laws. In particular, I pay close attention to issues of immigration in the lyrical content to establish how these songs contribute to the concept of anthems as symbolic hymns during significant political moments. What's more, by reviewing the rising presence of Latinos within the music industry, I examine how their billboard popularity—albeit ironically—parallels contentious steps towards anti-immigration laws. Traditionally, music dealing with issues of immigration in the Mexican-based corrido genre has been popularized, for instance, by Los Tigres del Norte. The recent anthems produced appear across genres and from artists of non-Mexican origins. For instance, the anthems that have emerged as a result of this historic event are the narrative and political “Mojado” by Ricardo Arjona and Intocable, “Nuestras Demandas” by the B-Side Players, and “Pal Norte” by Calle 13. I focus on how these anthems helped shape a collective identity for Latino communities, both consciously and unconsciously. Ultimately, by observing the significance of these musical productions on collective Latino immigrant identities through song and lyrical analysis, I hope to underscore the significance music has on ethnic and linguistically marginalized communities.

The Origins of Athenian Democracy

A. Fragosa

R. Gallucci - Classics

According to Aristotle's Constitution of the Athenians, Solon established the Athenian democracy in the early 6th century BC by guaranteeing participation in the assembly (ecclesia) to all free Athenian males. This view was widely accepted by scholars until the 1990's, when a number of prominent scholars diverged from traditional scholarship

and asserted different ideas. Today, many continue to argue against the standard convention; these scholars now attribute the emergence of democracy to Cleisthenes, who at the end of the same century created the new Council of 500 and the system of demes, thirds (trittyes), and tribes. This paper re-examines the complete body of reforms initiated by both Solon and Cleisthenes and argues that Solon instituted, for the first time at Athens, a democratic government. Certainly, one can argue that Cleisthenes' establishment of the council of the 500 and the new deme system were improvements over the Solonian Council of 400 and the old electoral districts. However, it was Solon who introduced the basic element necessary to sustain a democracy: participation by all free Athenian males in the general assembly. In addition to this major contribution toward a democratic polis, Solon offered a new equalized class structure and a democratic check through the establishment of new courts (heliaia). Therefore, the origins of democracy can only be attributed to Solon, for he alone gave the Athenian people a voice in and a share of their government.

The Structuration of Business Process Modeling

L. Franken

D. Seibold - Communication

This research project investigates the influence of social, inter-actional factors on the development of business process models within an organization. Organizations increasingly rely on business process models, or flowcharts of business activities as a mechanism for articulating and evaluating existing business processes. Since the creation of these models requires effective knowledge sharing among organizational members, business process modeling is fundamentally a social, inter-actional process. However, past research focuses on the technical and practical business aspects of business process modeling, ignoring the influence of the organizational social environment. Furthermore, there is little empirical evidence of the actual effectiveness of business process modeling. This investigation addresses these gaps in past research by using structuration theory to develop a theoretical framework that defines business process modeling as a practice that draws upon the embedded social structures of the organization. To assess the validity of the theoretical framework, a study of business process modeling practices within a small

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branch of a major government organization is conducted. A mixed methods design is utilized, including interviews with staff members, surveys, observation and recording of business process modeling meetings, and analysis of documentation produced during these meetings. Centering resonance analysis, a technique for analyzing complex discursive systems, will be used to analyze the various types of qualitative data. Although data collection is still underway, preliminary results suggest that (1) business process modeling is an effective knowledge management practice (2) a complex social process inextricably linked with various organizational social factors—especially members' interactions.

A Closer Step To Inclusion: An Examination of an Organization that Fosters Friendships Between People With and Without Intellectual Disabilities

A. Giang

B. Schneider, D. Segura - Sociology

Research on the effects of organizations that work with people with intellectual disabilities vary. Some scholars argue that these organizations segregate, isolate, exclude, and further divide people with intellectual disabilities from the broader community (Snow, 2007-09; Becker 1963 in Bogdan and Taylor 1989). Others assert that these organizations promote relationships between people with and without intellectual disabilities (Hartnett et al., 2008). Integral to the discussions is that historically, individuals perceived as intellectually "slow" or "disabled" have been labeled as "mentally retarded," or "mentally handicapped," which are devalued and stigmatized labels. Due to the negative connotations of the terms used to identify this particular community, many people and organizations began changing "mental retardation" to "intellectual disability." Despite these label changes, people with intellectual disabilities are still not well accepted in mainstream society. This research focuses on the case of one such organization, Best Buddies International, which tries to foster greater interaction between people with and without intellectual disabilities. Their premise is that people will become more educated and have greater understanding through the sharing of interests and friendships. This study looks at the different organizational practices Best Buddies International implements to end the stigmatiza-

tion of people with intellectual disabilities and create social change through a sense of inclusion.

Synthesis of Two-Network Hydrogels

A. Gilewski

C. Hawker - Chemistry and Biochemistry, Materials

Hydrogels have many useful properties that are currently being used in medicine, mainly for the purposes of tissue regeneration, bone cements, and sustained release drug delivery. Most hydrogel research focuses around a single network polymer matrix. The focus of this research is to synthesize a hydrogel consisting of two independent networks, quickly and in ambient conditions. For this to occur, the two separate networks must be mutually exclusive and have similar solubilities. The two reactions being examined are the Cu(I) catalyzed azide-alkyne reaction and the thiol-vinyl sulfone Michael-addition. While these reactions have been well-characterized to form hydrogel networks individually, the combination of the two is our area of research interest. Preliminary results indicate that these reactions progress very rapidly in ambient conditions. If successful, the two reactions will be able to take place simultaneously, in the same solution, rapidly, and in ambient conditions. The mechanical properties of double network gels should be far superior to those of single network hydrogels.

Performance Expectations

N. Ginther

J. Blascovich - Psychology

This study investigated the effect of performance expectancies and feedback on resource and demand evaluations and future performance. The participants' performance expectancies, as well as the feedback they received, were manipulated in this study. Utilizing the biopsychosocial model of challenge and threat, I hypothesized that persons who expected to succeed would have higher perceptions of resources (as indexed by cardiovascular reactivity), relative to those who expected to perform poorly. Further, I predicted that participants who expected to succeed but were given negative feedback would exhibit lower perceptions of resources relative to participants who expected to fail but were given positive feedback. This study was a

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2 (expectancy: confirmation or violation) x 2 (feedback: positive or negative) between-subjects factorial design. Participants were randomly assigned to one of four conditions: (1) expectancy to succeed-confirmation, (2) expectancy to succeed-violation, (3) expectancy to fail-confirmation, (4) expectancy to fail-violation. The hypotheses were not confirmed by the cardiovascular data. There was no significant difference between conditions for the first task, however during the second task participants who received confirmatory feedback were more threatened, (as indexed by cardiovascular activity), in comparison to those in the violation condition. Implications for future research are discussed.

The Role of Guilt in Cooperation

M. Guemo

P. Kuhn - Economics

Experiments using the Voluntary Contribution Mechanism (VCM) show that group cooperation declines after several periods in repeated interactions. There are mechanisms, however, like punishment that could sustain cooperation by increasing the incentives to cooperate. This research examined how the presence or absence of guilt influences cooperative behavior. Expressing guilt could be a way of repairing one's reputation as a group member after under-contributing in a collective action. Without negative emotions among members, continued cooperation might be possible. To test this, I use a modified VCM. The treatment differs from the standard VCM because participants had the option to return any portion of their earnings from the group project at the end of every period. To the extent that returning earnings could be interpreted as guilt, this experiment sheds light on the role of guilt in cooperation. Regression analysis indicates that the more guilt an individual's group members show in the previous period, the higher that individual's contribution will be in the following period. Further research will be needed to determine if cooperation will remain stable in groups in which under-contributors express guilt.

Evolved Mechanisms Designed to Detect Free Riders

M. Guemo

L. Cosmides - Psychology

Free riders, individuals who gain benefits from a multi-person cooperative endeavor despite not paying the costs of contributing, can cause cooperation to unravel, both in real-time cooperative situations and over evolutionarily relevant time spans. For cooperation to flourish, the mind must contain mechanisms that identify free riding individuals; then activate downstream responses such as avoidance or punishment. Past studies have shown that the mind defines free riders as individuals who intentionally under-contribute, distinguishing them from individuals who under-contributed due to accident. This previous work was designed to show that free riders are represented by a distinct, specialized category in the mind. But is this conclusion correct? Or does the mind fold free riders into a more general category of intentional moral violators? To test this, we used an implicit measure of social categorization to determine whether free riders would be distinguished from another type of moral violator, individuals who steal communally owned resources. Results revealed that free riders were categorized separately from thieves. This shows that the mind does not simply group all moral violators together in one category and further supports the view that there are specialized mechanisms designed to detect free riders.

The Decriminalization of Prostitution

J. L. Hammond

L. Rupp - Feminist Studies

From a historical perspective, the criminalization of prostitution in the United States is a fairly recent development. Over the past 100 years the sale of sexual services has encountered increased surveillance, criminalization, and stigmatization, and in turn these developments have spawned the creation and growth of sex worker led movements demanding equal rights, decriminalization, respect, and public awareness. This research paper summarizes the historical trajectory of the criminalization of sex work in the United States as well as the resistance movement developed over the past 40 years by sex workers themselves.

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An analysis of two propositions that would have decriminalized sex work in the cities of Berkeley and San Francisco, California, considers the reasons for their failure and how decriminalization can be presented to a broad audience in order to win support in local communities. As a former sex worker, I use my personal experiences, interviews with former sex workers and sex worker advocates, and popular and scholarly debate to frame my analysis of the issue of decriminalization of prostitution.

Barack Obama: Racial Politics

B. Hassan

S. Batiste - Black Studies, English

On November 4, 2008, history was made when Barack Hussein Obama, became the first black president of the United States of America. This is an extraordinary accomplishment because America, which is scarred by slavery and institutionalized racism, elected someone other than a wealthy, privileged, white male to lead its people. What is even more astonishing than Barack Obama winning the presidency is how he managed to achieve that level of success while being a mixed ancestry individual who identifies as a black man with a white mother. Since Barack Obama won, there has been a shift to where the dominant society feels that the thread of racism has been vanquished because there is a black man in office, and henceforth racism is over. At the same time white supremacists have developed a level of comfort in spouting clearly racist dogma in public. Many feel that in Obama's presidency, race was a colorless element, and because he never played the color card he won. This black man has shown that he understands the racial dichotomy of America, and he has played it to his advantage. Through the works of Daniel's "More Than Black," Davis' "Who Is Black," Steele's "Bound Man," Obama's "Dreams of My Father," and scholarly articles by Michele Elam, I will analyze Obama's embedded strategies, and demonstrate that it was in fact because Obama played some form of the race card discreetly and effectively, that ultimately lead to his victory on that fateful day.

Banda de Calaveras

E. Hernandez

H. Reese - Art

Captivated by Latino cultures and celebrations, I sought to become more acquainted with Dia De Los Muertos and its significance in Mexican culture. Using a short story of a "Dia de los Muertos" celebration written by a friend, I studied Latino cultures and fashion throughout history to utilize as inspiration for my illustrations that would eventually make the pages of my book. Beginning my sketches in pen and paper, I turned my illustrations into photopolymer plates to create multiples of the same images. Once I had created multiple prints of each of my 6 pages, I studied different methods of bookbinding to find the method that would best suit my needs and the overall aesthetics of my project. In a longing to work in the more traditional method of printmaking, I also created 12x24 prints of the four main characters of my book. One of the larger prints was chosen at random to place inside each book to bring an element of surprise to the reader. In researching Latino cultures, I became very knowledgeable of the effects society held on youth and their fashion and culture. In my attempts to echo what I've learned, the attire of my characters as well as their surroundings are representative of their cultures and lifestyles. Ultimately, Banda de Calaveras serves as a story and celebration of Dia de los Muertos through a different perspective to bring to light a celebration that is loved and also forgotten.

Silane Coated Nanofluidic Channels

D. Herrick

M. Napoli - Mechanical Engineering

We present a study of surface charge on bare and chemically modified fused silica nanochannels that are in contact with aqueous electrolyte solutions. Electrokinetic phenomena at the nanoscale are largely governed by the channel surface charge due to the large surface area to volume ratio inherent in such systems. Thus, knowledge of the surface charge becomes essential in analyzing and interpreting electrokinetic flow data. In the present work, we modify nanofluidic silica surfaces with 2 different silanes -carboxyethylsilanetriol, 3-cyanopropyldimethylchlorosilane, and 3-aminopropyldimethylethoxysilane, which are

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expected to impart negative, neutral and positive charges to the surface. In order to characterize the various nanofluidic channels, we conducted experiments to measure the electrical current in 200nm depth nanofluidic channels with 7 different concentrations of Potassium chloride electrolyte, (0.01mM- 0.1M). Our data can be described by an electrokinetic model parameterized only by the surface charge density, since the electrical conductance of a nanofluidic channel has been shown to exhibit a surface charge dependent low plateau region in the low electrolyte concentration regime[1]. The combination of our experiments and our theoretical model will give us accurate information about the surface charge of the nanofluidic channels allowing for precise control of electrokinetic flows.

1. Stein, D., M. Kruithof, and C. Dekker, Surface-Charge-Governed Ion Transport in Nanofluidic Channels. *Physical Review Letters*, 2004. 93(3): p. 035901. 

The 1920's in Fashion and The Process of Design

K. Hoppe

A. Bruice - Theater and Dance

This project is a research based endeavor, which started with the cataloging of garments owned by the Theater and Dance Department, concentrating on the years spanning 1920 through 1929. I researched the fabric content, influences, and gave dates for when they were constructed. The result was a research book documenting the visible change in women's fashion in the decade of the 1920's. My next step in the project was using the research to present fashion of the time translated to costume design in the historical context of a theatre production. I chose Noel Coward's play "Hay Fever" to exemplify this and the ultimate result is a showcase of my project in the Theater and Dance Department at The University of California, Santa Barbara.

Face Threat Appraisal Mediates Emotional Responses

S. Hughes

D. Mackie - Psychology

This study investigates the appraisal of differing scenarios in the context of: negative face threats, positive face threats, or a combination of the two. Examined are how emotional responses are mediated and judgements arrived at following the reading of scenarios containing transgressions committed by an out-group against the participant's in-group. Participants read three scenarios and rated the extent to which each scenario matched statements defining the two types of face threat. They next reported emotions anticipated based on the appearance of the scenario. Next they learned either that the outgroup had apologized and the ingroup had forgiven them or only that the ingroup had forgiven the outgroup. The participants then repeated the previous emotional measures as well as several new judgment measures. We hypothesized that compared to the negative and mixed face threat scenarios the participants would report greater satisfaction, less anger and less fear about the event and with the outgroup for the positive scenario. We also hypothesized that the positive scenario would elicit higher ratings of forgiveness and appropriateness of forgiveness as well as lower ratings on the desire for retribution measure. We hypothesized that the mixed scenario would yield greater satisfaction, less anger and less fear than the negative scenario. The study revealed that satisfaction was highest in the positive scenario and forgiveness was the highest and most appropriate in the positive and mixed scenarios. The desire for retribution was greatest in the negative scenario. Anger was the lowest in the mixed scenario. Participants correctly identified the negative scenario but did not rate the positive face threat as predicted.

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Effects of pH and Temperature on Gametes and Fertilization Success of the Sea Urchin, *Lytechinus pictus*

B. Jones

G. Hofmann - Ecology, Evolution and Marine Biology

P. Yu - Marine Science Institute

Increasingly high levels of anthropogenic CO₂ are quickly dissolving into the oceans and altering its chemistry. The Intergovernmental Panel on Climate Change (IPCC) estimates for near future temperature and pH levels in our oceans are of great concern. Research has focused on assessing how organisms will respond to the acidification and warming temperatures. Some marine invertebrates, which spawn their gametes into the ocean, have shown vulnerability to these changes resulting in decreased fertilization success. We will be examining the effects of these variables on the gametes and fertilization success of the sea urchin, *Lytechinus pictus*. Acclimatization of adults prior to spawning may affect the success of fertilization. Spawning will be induced pre and post acclimatization to multiple combinations of temperatures and pCO₂. We will inspect the sperm, eggs and fertilization success determined by the proportion of eggs that show successful early development. While this species has been assessed in previous studies, this is the first to investigate their fertilization success in ocean temperature and acidification. We suspect there will be significant consequences to the physiology of the gametes; we predict that the change in ocean chemistry will reduce sperm motility, lessen egg viability and decrease fertilization rates. We also predict that the sperm, eggs and fertilization of the acclimatized adult will have better viability than those of the non-acclimatized adults. If the expected ocean chemistry is capable of reducing fertilization, urchin populations may show a decline, causing significant ecological problems.

Xicana ZapArtistas in the Eastside of Los Angeles

A. Juarez

B. Schneider - Sociology

Inspired by the 1994 Zapatista rebellion in Chiapas, Mexico, a collective uprising formed a cultural movement based in the Eastside of Los Angeles. In an attempt to achieve

scholarly balance within existing literature, and illuminate practices that are central to this movement, this project places xicana cultural “art-ivists” at the center of academic discourse. Using basic qualitative approaches, three artists are explored: Cihuatl-Ce, FE, and Las Ramonas. Data was collected from online sources and field observations. This research examines how these particular artists fuse art and culture to utilize it as a political instrument of transformational resistance and rebellion. The analysis thus far indicates that despite their differing mediums of expression, these “womyn” share common purposes. Whether through revolutionary hip-hop beats, medicinal poetry, comedic “teatro” performances, or a combination of these, their work is intended to inform, transform, and empower all historically oppressed peoples. Additionally, the feminine energy and creativity expressed in their performances speak to “womyn” who continue to fight against white hegemony and masculine domination. Through the autonomous creation of diverse spaces of creative expression and political education, these voices struggle side by side with the Zapatistas for what they declare as: “un mundo donde quepan muchos mundos.”

Social Support, Stress, and Performance

J. Kadin

N. Collins - Psychology

Prior research has shown that social support helps individuals cope with stressful life events and is associated with better health and well-being. However, few studies have examined the link between social support, physiological responses, and performance. To examine these links, we experimentally manipulated social support from a romantic partner in the context of a stressful speech task. We hypothesized that individuals who received social support would exhibit lower levels of the stress hormone cortisol, and would perform better. We also hypothesized that self-esteem would moderate this effect such that people with low self-esteem would benefit most from social support. Data collection has been completed and analyses are in progress.

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Magnetic Nanoparticle Spin Waveguides

J.C. Kally

S.J. Allen – Physics

Small scale magnetostatic spin wave devices are potentially important for on-chip filters utilized for communication systems and spin wave logic devices. The use of ferromagnetic nanoparticle films, instead of continuous metallic films, is expected to reduce the eddy current damping of the spin waves. We fabricated and measured magnetic properties of micron-sized magnetic nanoparticle stripes that are potentially useful as spin waveguides for spin wave based logic devices. To fabricate these structures we use concentrated colloidal suspension of nano-sized ferromagnetic particles stably dispersed in a carrier liquid such as hexane or mineral oil. Spatially patterned magnetic fields/ pre-patterned Si wafers form liquid nanoparticle patterns. Subsequent removal of the solvent by drying leaves patterned nano particle structures. To measure we use a vector network analyzer to couple in and out the microwave current to the magnetization oscillations in the nanoparticle spin waveguide through microwave coupling loops, which are placed under the pre-patterned structures. We show and discuss results from the microwave transmission measurements of fabricated structures with iron (II,III) oxide and iron platinum nanoparticle spin waveguides.

In Your Face: Understanding Parent-Adolescent Relationships in the Context of Facebook

M. Kanter

T. Afifi - Communication

As an adolescent, a prevalent area of contention with one's parent is the notion of maintaining control and ownership over one's private information, issues that are extremely salient among adolescent Facebook users. Thus, the current study will utilize Petronio's theory of Communication Privacy Management (CPM) (2000), to examine the conditions under which adolescents perceive their parent on Facebook as a privacy invasion, and how it affects the quality of the parent-adolescent relationship. The study's required a student participant and one of his or her randomly selected parents to complete two sur-

veys, one at the beginning of the quarter and one at the end of the quarter. Each parent was randomly assigned to a control group or an experimental group, the latter of which were instructed to create a Facebook account and become 'Facebook friends' with their child. The author will argue that in general, adolescents whose parents are on Facebook will perceive greater privacy invasions than those whose parents are not on Facebook. However, those perceptions of intrusiveness may not necessarily lead to diminished relationship quality. This particularly is the case if the adolescent already maintains a relatively conflict-free, close, and satisfying relationship with his or her parent. Specifically, according to CPM, adolescents who enjoy a high quality parent-adolescent relationship will also view disclosure to that parent as less risky. Even though they may view their parent's presence on Facebook as a privacy invasion, their prior relationship with their parent will likely act as a buffer against any potential negative effects.

Effects of Low Temperature Preservation on Bone

B. Kaye

P. Hansma - Physics

Frozen bone is a crucial aspect of forthcoming bone research because freezing is a preferred method of preservation of bone used for transplantation in addition to the fact that fresh bone is very difficult to obtain. Bovine femur and human tibia were used to determine the effects of subzero preservation methods. The Reference Point Indentation Instrument was used to determine the Indentation Distance Increase (IDI) and Total Indentation Distance (TID) quantities, which correlate strongly with bone fracturability. Both baked and unbaked bones were used. Baked bone was used to simulate bone with a weakened organic extracellular matrix. In unbaked bovine, a 15% increase ($p < 0.0004$) in IDI was noted after freezing, but there was no difference in TID. Baked bovine had no change in IDI or TID. This leads us to postulate that a bone with less organic matrix will have a smaller degradation due to the first freeze-thaw cycle. Furthermore, subsequent freeze-thaw cycles no longer degrade the bone.

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OPEC : An Evaluation

R. Khosharay

B. Cohen - Political Science

OPEC is an organization that has been active for several decades and will celebrate its 50th anniversary this year. The organization's history has been one of successes and failures; a history that also has been characterized by the frequent dishonesty of its membership. Many argue that the cartel has become defunct, especially since the 1980s, while others argue that its power is on the rise again. Considering the recent increases in oil prices and the rising oil consumption around the world, it is important to evaluate the cartel. To do so several questions will be investigated. What motivates membership in the cartel? In addition, to what extent does OPEC affect oil supply? Besides being able to effect supply, by what other measures can we gauge the power of OPEC? This paper will use qualitative analysis and case studies to answer these questions. By looking at economic indicators, exports, regime type, and other variables of OPEC countries and major non-OPEC exporters (Russia, Mexico, Norway) the following conclusions are anticipated to be reached. Regime type and degree of economic diversification play key roles in determining membership in OPEC for oil exporting countries. Also, despite the increased market shares of major players without OPEC affiliation, OPEC as a collective can yet significantly effect the oil market and its ability to do so will rise in the future. Its power to affect the oil supply it is strengthened by the following: peak oil, production costs, oil depletion, increased consumption and current lack of a adequate substitute.

Neurogenesis & the Antipsychotic Drug Olanzapine

S. Khoubian

T. Kippin - Psychology

The purpose of this experiment is to study the biological mechanisms behind the therapeutic effects of the atypical antipsychotic drug olanzapine while focusing on newly produced neurons in the hippocampus and olfactory bulb. In this experiment, we administered either olanzapine or vehicle to mice for a period of 28 days. Fourteen days after the initiation of drug treatment, mice were injected with

bromodeoxyuridine (BrdU; 60 mg/kg, i.p. X 5; once every 3 hrs) to label mitotically active cells. Our preliminary findings are that olanzapine increases BrdU labeled cells in the subventricular zone (SVZ), but not in the striatum or hippocampus. It suggests an increase in new neurons in the SVZ, which is consistent with studies employing equivalent doses of the typical antipsychotic drug haloperidol. This finding indicates that although the atypical antipsychotic drug, olanzapine, operates through a different mechanism, it produces a similar effect on forebrain neurogenesis as observed with haloperidol suggesting a role for neurogenesis in the treatment of psychotic disorders.

Psychology of Religion and Forgiveness

E. Kobernick

H. Kim - Psychology

The aim of this research is to examine how affect may moderate the relationship between type of religiosity (intrinsic or extrinsic) and the willingness to forgive. Previous research has found that intrinsically religious people are more likely to forgive (Gordon et al., 2008). Additionally, past research has found that mood moderates how much people adhere to cultural norms. When in negative affective states, people are more likely to adhere to cultural norms, and they deviate more from cultural norms when in positive affective states (Ashton-James et al, 2009). Similarly, people may adhere more strongly to their specific religious norms when in negative affective states. Therefore, I hypothesize that people who are intrinsically religious will be more likely to forgive compared to those who are extrinsically religious, and this difference will be greatest for people in a negative affective state versus a positive affective state. This study has a 2 (mood: positive vs. negative) x continuous (religiosity: intrinsic-extrinsic) design. There will be approximately 60 participants (30 per condition). The anticipation is that the results will yield new understanding about the effect of mood and religiosity on forgiveness.

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Does Drought Alter the Relative Importance of Top-Down vs. Bottom-Up Control in Streams?

L. Koenig

B. Cardinale – Ecology, Evolution, and Marine Biology

Climate change models predict that many temperate streams will soon experience greater frequency and duration of droughts. For example, in streams of the Sierra Nevada mountain range, reduced snow pack and earlier spring melts are expected to reduce summer baseflows leading to extended periods of low or no flow. The impact these droughts will have on the structure and function of stream ecosystems is largely unknown. In this study, we examined how increased drought duration impacts the relative importance of two factors known to control the production of algal biomass: herbivores and nutrient supply. We established nutrient diffusing agars (controls and additions) in experimental channels subjected to increasing drought duration (0 to 8 days) with invertebrate herbivores either present or excluded. Effects of herbivory on algal biomass remained constant as the duration of droughts increased. However, bottom-up effects of nutrient supply on biomass diminished as drought duration increased. Our results suggest that top-down controls by consumers may become relatively more important, and bottom-up effects of resources less important in the face of climate change.

Exclusion of Low-Contributors in Public Goods

A. Kosh

M. Gurven – Anthropology

Imagine you are a herdsman and share a public plot of land with other herdsmen. Increasing your herd maximizes your profits, but having too many cattle leads to overgrazing. Hence, when you add cattle to the land, you receive the entire benefit of the additional animal at only a fraction of the cost (because the cost is shared amongst all herdsmen). The dilemma is that all herdsmen think in this way, which leads to overgrazing. This problem, presented by Garrett Hardin in 1968 and known as the “Tragedy of the Commons,” exists in many different contexts and remains difficult to solve. In the study presented, subjects play a game requiring them to make individual decisions regard-

ing allocation of resources within a group. They can choose to keep money for themselves, invest money in a publicly available commodity, or contribute money to a high price of exclusion, which prevents low-contributors from sharing in the public good. The results of this study highlight potential means to increase group cooperation and are applicable, for example, to global environmental issues such as recycling and conservation.

Gender Differences in Reciprocal Behavior

M. Kovach

P. Kuhn – Economics

This paper examines reciprocal behavior in males and females and its impact on social outcomes. Reciprocity, or reciprocal behavior, is an in-kind response to the actions of others. For this paper, a simple decision making experiment was conducted. In addition, a survey was administered to record the participants’ subjective levels of reciprocity, as well as age, GPA, size of social network, hours employed, and subjective levels of competitiveness and life satisfaction. I found no gender difference in actual behavior or in self-reported reciprocity levels, but I found a significant age effect on reciprocal behavior. I also found that positive reciprocity correlates with a more satisfying life and is related to academic (GPA) performance.

Seeds of the Contemporary New Right

C. Kwon

L. Kalman – History

When the actor-turned-politician Ronald Reagan made his “Time for Choosing” speech during the 1964 Presidential elections, conservatives became smitten with him. When Reagan announced his candidacy for California governor, one particular organization took notice. The California Young Americans for Freedom (Cal-YAF), which had been busy fighting the New Left proliferating in universities, directed its energy to supporting Reagan’s gubernatorial bid. Cal-YAF’s support for Reagan would continue throughout the sixties and into the seventies when Reagan ran for President in 1976 and 1980. Yet, Cal-YAF’s strong grassroots mobilization against the Left and for Reagan would never be as strong as in the sixties. Ideological factionalism

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plagued the organization and the organization became a proxy of larger conservative organizations. Nonetheless, Cal-YAF would remain significant. Members of Cal-YAF became important players in statewide and national politics and in recent times the organization has experienced a resurrection.

Growth of Nanorods for Thermoelectric Devices

N. Labrador

T. Buehl, C. Palmstrom - Materials

The low solubility of Er in GaAs and GaSb results in the formation of ErAs nanostructures when GaAs or GaSb is co-deposited with a low atomic percent Er/Ga ratio by molecular beam epitaxy. For low-index surfaces such as (100), nanoparticles form. These nanoparticles have already been used in thermoelectric devices. However, for growth on high-index ($h11\bar{1}A$ ($h=1,2,3,\dots$)) GaAs and GaSb surfaces low concentrations of Er produce ErAs nanorods throughout the material. The orientation of these nanorods depends upon the value of " h " above. The main objective of this study is to elucidate how these nanorods are growing and to investigate their use in thermoelectrics. This investigation will proceed in a number of different steps. Samples will be grown in a molecular beam epitaxy system under the supervision of my mentor. Optical absorption measurements will be used qualitatively to understand whether or not nanoparticles or nanorods formed during growth. Additionally, both atomic force microscopy and scanning tunneling microscopy will be used to understand how these nanorods are forming during growth. Finally, Hall measurements will be used to determine the electrical conductivity of these samples that will partly ascertain whether or not they are a good thermoelectric material.

Activities and Adornments

A. LaPointe

H. Reese - Art

I have been studying issues of sub-cultural identity through the medium of visual art, specifically print. I am interested in groups that separate themselves from mainstream society not by race or creed but through the practice of certain

unique skills such as handcrafts, music, art making, performance or by enthusiasm for a particular graphic, fashion or music style (punk, Goth, etc.) I pursued this study by creating two portrait series in a similar style depicting members of two contrasting subcultures. The first is series of carnival sideshow performers, the second a more intimate series of women who are associated with the California Rockabilly/Psychobilly scene. "Step Right Up," the side show group, consists of five broadsides on cloth measuring eighteen by sixty inches, in an edition of five. Each print contains the name of the character and a torso or full length portrait rendered in linoleum block, silkscreen and pochoir printing. The rockabilly girl series is smaller consisting of several, four and a half by six inch multiple block linoleum prints on Rives BFK paper in an edition of five. The prints are a simple and beautiful way of offering the viewer insights into these subcultures. My reading, visual research and firsthand experience with these subcultures has instilled me with a great respect for the effort and sacrifices of gaining such a skill or persona. Each print is a tangible record of my esteem and an attempt to repay the efforts of each subject with skilled and aesthetic labor of my own.

AOM in Marine Hydrocarbon Seep Sediments

J. Lawrence

F. Kinnaman, D. Valentine - Earth Science

The hydrocarbon seeps in the Santa Monica Basin release methane (CH_4), a powerful greenhouse gas, into the marine environment. Methanotrophic bacteria in the sediments surrounding seeps oxidize this methane anaerobically and may be an effective biofilter for the release of CH_4 to the ocean and atmosphere. Samples from sediment cores at and near these 800m depth seeps were incubated with small amounts of $^{14}CH_4$ for 24 hours, and were then analyzed for methane concentration, residual $^{14}CH_4$, and $^{14}CO_2$. These results yielded microbial oxidation rates and methane turnover times for each core. High rates of anaerobic oxidation of methane (AOM) were quantified at this site, as high as $1.5 \mu\text{mol } CH_4 \text{ cm}^{-3} \text{ day}^{-1}$. The majority of methane oxidation took place in the top 10 cm of the sediment. Despite high methane concentrations (up to 5mM), methane turnover times were on the scale of days for shallow, active portions of the core, increasing to months for deeper sections. These results suggest marine sediments are an effective CH_4 filter in deep, stable hydrocarbon seeps.

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Petrarchan Humor: An Interdisciplinary Approach to Irony

P. Leonelli

C. Lansing - History

This project focuses on Petrarch, a fourteenth-century Italian poet and moral philosopher, and his use of humor to convey his moral precepts. Scholars have typically regarded Petrarch as a serious, stoic, historical figure. Application of comedy theory, however, shows that Petrarch's Latin works, such as "On His Own Ignorance," "Letters of Old Age," and "Remedies" contain humorous elements. By using both literary and historical methodologies, a new perspective of Petrarch and his philosophical goals can be gained. Analysis of the divide between literary and historical approaches to Petrarch demonstrates why Petrarch's humor has not been discussed in length.

Rule of Law in Mexico Into the 21st Century

C. Levoff

S. Cline - Latin American and Iberian Studies, History

This project will examine order, accountability, and equal access to justice in Mexico in the time period spanning the early 1930's, and the rise of the PRI, or Institutional Revolutionary Party, to modern day Mexico. Through a series of cases studies Mexican rule of law will be examined in order to discern if democracy and modernity have brought improved living conditions to our neighbor to the south. Case studies involved include cases of forced confessions, unfair trials, electoral fraud, torture, and murder, all at the hands of those responsible for upholding justice in the country.

Effects of Herbivore Diversity Upon Algal Biomass

B. Lewis

B. Cardinale - Ecology, Evolution, and Marine Biology

Increasing herbivore diversity can cause plant biomass to increase as a result of competition between herbivores or decrease as a result of complementarity / facilitation

between herbivores. This study tested these competing hypotheses by experimentally eliminating a dominant herbivore within a natural stream ecosystem. My hypothesis was that elimination of a dominant herbivore would result in increased algal biomass relative to controls due to reduced complementary feeding / facilitation between the herbivores present. The experiment was performed at the Sierra Nevada Aquatic Research Laboratory. Twenty in-stream channels were used. Nets on the upstream and downstream ends of the channels enabled the exclusion / enumeration of herbivores. Ten channels were randomly assigned the manipulation treatment. Mayflies from the family ephemerellidae were excluded from these channels. The remaining ten channels served as controls. All herbivores were allowed into these channels. Tiles were placed in each channel to serve as algal growth surfaces. After one month, the algae on the tiles were sampled and algal biomass values were obtained. All invertebrates within each channel were enumerated. The abundance and biomass of ephemerellid mayflies were significantly reduced within the manipulation treatment. Chlorophyll values were not significantly different between the manipulation and control treatments. This suggests that a dramatic reduction in the abundance and biomass of a dominant herbivore had no effect upon algal biomass. A possible explanation is that bottom-up forces such as nutrient limitation have a much stronger influence upon algal biomass than do top-down forces such as herbivory within this system.

Flexible Connectors: Public Interventions

R. Lindt

K. Yasuda - Art

Through the use of handmade and flexible prosthetics, my work explores shifting boundaries within relationships as well as dynamics of interrelationships. The tension between the individual in the group setting is one that I examine through several mediums, including both individual and collaborative performance, interactive art and video / projection. The body is a central element and theme, which directly engages the inventory of personal experiences housed within the contained yet physically flexible figure. Performance based experiences allow the process and the outcome to become one in the present, without the emphasis on an end product. Power relations in pairs or groups within a specific environment serve as particular interest, allowing the flexible prosthetics or connectors

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to alter personal space between both the performers and the audience. By using public space as both a venue for interactions and a stage for collaborative performance, loosely choreographed ephemeral interventions have the potential to create breaks in normal, everyday activity. Simple gestures, tasks and actions performed become complex and poignant within the context of a physically connected group within a site specific environment. Using the concept of selfhood as a point of departure, my role of facilitator, architect and performer actualizes both simple individual bodily gestures, as well as group actions. Collaborations across the boundaries of discipline and familiarity reveal the flexibility of social roles and synthetic nature of preconceived notions of standard behavior. By creating experiences in sometimes unassuming public spaces, I consistently take into account socio-political dynamics as well as memory, creating mobile site specific works.

Spatial and Temporal Variability in *Phyllospadix torreyi* Seedling Densities in the California Central Coast Region

H. Long

C. Blanchette – Ecology, Evolution, and Marine Biology

Phyllospadix torreyi, commonly known as surfgrass, is a dioecious near shore marine flowering plant and forms beds that are critical habitat for numerous invertebrates and fish. *P. torreyi* has extremely female biased populations (Williams 1995), but can produce large numbers of seeds. Surfgrass seeds require algal hosts with morphologies suitable for seed capture to successfully recruit and germinate. This study attempts to characterize patterns of seedling recruitment relative to availability of algal hosts and differences in sex ratios at four central California sites. Over the course of 2009-2010, we performed repeated seedling and flowering shoot surveys at four main sites along the Santa Barbara Channel as well as seedling surveys at additional sites in the Central Coast region. Results showed that in most cases, seedling abundance is relatively consistent across seasons at each site but highly variable between sites. Across all sites, 63.9% - 91.7% of the surveyed seedling attachment substrate was algae of four distinct morphologies. At three of the four main sites, significantly more female flowering shoots were found than male flowering shoots; no males were found at two of these sites. In spring of 2009, the fourth site (Hammond's Beach) had a

sex ratio not significantly different from 50:50, but in other seasons it was also biased towards females. Further analysis of results will show if observed patterns are explained by sex ratios, flowering abundances, or algal host abundances. Comparison of results to other studies will help identify patterns in seedling densities, ultimately aiding the conservation and management of surfgrass.

Marginalization within a Coastal Community: The Case of Latinos in Carpinteria, CA

G. Lopez

J. Palerm - Anthropology

The transition from production of mechanized crops to production of specialty crops in the California agriculture industry has resulted in the settlement of Latino migrants in rural, agriculture towns in California. As a result, these towns are experiencing a dramatic change in population, infrastructure, society, and economy, with the Latinos becoming the majority of the population. Carpinteria, known for its greenhouse and floriculture industry, is one of the towns effected by this phenomenon; however, the city has yet to be relinquished to the Latino migrants. This is in contrast to Latino communities in other rural towns, such as Delano and Mecca (Palerm, 2006). The purpose of this study is to gain insight into the means by which the city of Carpinteria has adjusted to the settlement of Latino migrant workers by examining the use and management of public spaces throughout Carpinteria. Although this investigation is ongoing, so far the study reveals clandestine segregation between the Latino population and the rest of the population in public areas such as downtown Carpinteria, community centers, and parks. This lack of adjustment to the Latinos in Carpinteria continues to cause issues for the Latino population in terms of housing, community involvement, and political influence; hence, Latinos in Carpinteria continue to be undermined despite their major contributions to the agriculture industry of the city.

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Don't Frame My Politics: Young People's Views of Social Security

H. Lopez

S. Falasca-Zamponi - Sociology

Throughout human history people have had to face the problem of how to support themselves and their families in old age, when too ill to work, unemployed, or when a family breadwinner dies. This is called a problem of economic security, and it is this problem that Social Security, and many other institutions and practices, were created to solve. Scholars from diverse academic disciplines have studied issues of economic security at many levels, and they have generally argued that Social Security creates generational conflicts between the young, who are supposed to pay for their elders, and the old. However, minimal empirical research is available on generational equity and Social Security policy that would be able to demonstrate the validity of the above argument. This study, in contrast, collects data on young peoples' views of Social Security in order to test whether young people value the importance of this program, and also whether media attention contributes to the conceptualization of policy issues in the young population. Data was gathered through a laboratory experiment, followed by in-depth individual interviews with the 24 participants. Findings reveal that "intergenerational conflict" is overrated, that young people actually care about the Social Security program, and that the media plays a significant part in shaping opinions held by the younger generation.

How Youth Resist Forms of State Violence

J. Lumbreras

V. Rios - Sociology

This study examines how law enforcement officials and their actions have impacted Latino youth in specific neighborhoods. Studies have shown that youth in disadvantaged communities have been disproportionately victimized by pro-active policing practices and strategies. Few studies, however, have compared policing practiced in economically depressed cities populated by disadvantaged youth versus policing procedures utilized in affluent cities with a resident group of disadvantaged youth. Also of significance is the way in which these youthful popula-

tions negotiate police misconduct. This comparative study focuses on the Latino youth population in two California communities, Santa Barbara, a small affluent city, and Compton, a larger historically disadvantaged inner city. Data was drawn from a qualitative ethnographic study that included twenty in-depth interviews with Latino youth in both cities, as well as field observations documenting the youth experiences and perceptions of police harassment and misconduct. Preliminary findings suggest that youth from both cities claim officials from the police authorities view them as a social threat. Moreover, stressing the different forms of surveillance and violence that Latino youth encounter with local law enforcement, findings demonstrate that policing in Santa Barbara and Compton is perceived by local youth as a strategy to contain them in their local community.

Culture and Self-Esteem

J. Luu

H. Kim - Psychology

We hypothesize that European Americans and Asians will demonstrate differences of viewpoint when assessing the importance that the issue of self-esteem plays in their lives. Also postulated is that Asian-Americans will differ from both these groups, based on whether their evaluations are dependent on terms expressive of their own personal values, or based on their own values in the context of their own culture. We believe that Asian-Americans will have these conflicts as a direct result of their mixed heritage. Furthermore, we also contend that Asian-Americans, along with Asians, will have less of a preference for consistency compared to European Americans due to these paradoxical views. Existing literature has already demonstrated that Asians have less of an emphasis on consistency, and a greater acceptance of contradictory sentiments. However, because of this discrepancy, we hypothesize that Asian-Americans will report more perceived stress than both Asians and European Americans. To support these hypotheses, participants from the three cultural groups will complete an online questionnaire composed of a variety of measures involving self-esteem, preference for consistency, perceived stress, and other aspects of psychological well-being.

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Guided Discovery-Based E-Learning

A. MacNamara

R. Mayer - Psychology

Based on the principles of scaffolding, this study seeks to determine if specific guidance on what to learn increases the learning outcome of discovery-based educational computer games. Based on the problem of extraneous cognitive load, this study also seeks to determine if an educational computer game can lead to a better learning outcome than a simple slideshow that presents the same educational information. A three-group experimental design was conducted with undergraduate students from the University of California, Santa Barbara. The discovery condition played a computer game on the causes of disease, the guided-discovery condition played the same game while filling out a worksheet on information they need to learn, and the control condition received the same information on the causes of disease in the form of a computer slideshow. I anticipate that the results will show that the control condition will do better than the discovery condition, while the guided-discovery condition will demonstrate enhanced performance in comparison to both the control and the discovery condition.

Irish Perspectives of James II

J. Madison

S. McGee - History

In 1685, Irish Catholics who had been harshly treated by Cromwell's conquest half a century earlier found hope in the accession of James II of England and VII of Scotland. James's pro-Catholic policies presented, in the minds of the Irish and Old English aristocracy, an opportunity to regain their lands and turn the tide against an oppressive Protestant dominion. James, however, was deposed by William of Orange and, after fleeing England, launched a campaign in Ireland to regain the throne. Tensions culminated during the battle of the Boyne where James fled, leaving Irish Catholics to fight without their king. Though the Irish continued the struggle for another year, they were eventually defeated and as a result faced a period of penal laws that greatly reduced their status and barred their ability to hold office in Parliament. Though one would assume that Irish Catholic sentiment towards

James II was largely negative based on his behavior at the Boyne, curiously, Catholics remained loyal to the Stuart line. This paper examines the cause of this loyalty. I have drawn evidence from the writings of Irish Catholic and Irish Protestant Jacobites, including documents such as correspondence, personal accounts, pamphlets, sermons, and Irish poetry. Such research suggests that Irish Catholics remained loyal to the Stuart line due to the nature of the international war that was raging between Louis XIV and the Augsburg Alliance. Also to be factored in is the importance of Ireland in that conflict, a religious sense of divine destiny, and a staunch loyalty to the rightful succession of the Stuart kings.

Filipina/o American College Students and the PCN

P. Mardo

A. Harsha - Asian American Studies

The Pilipino Cultural Night (PCN) is a popular cultural variety show that occurs at college campuses across the United States. The goal of this senior thesis project is to understand the PCN experience through the perspectives of the Filipina/o American students involved in the production of the show. Previous studies on the PCN have described the performative aspect of the PCN and its problematic portrayal of Filipina/o American "culture". However, I would like to argue that the PCN is a unique and important vehicle for learning about culture and redefining the meaning of culture for Filipina/o Americans college students. More importantly, the social impact of the PCN on the students is a means for them to build community. This is especially important at colleges with limited access to cultural resources. Through an analysis of past research on the PCN, interviews, and questionnaires, I will explore the importance of the PCN as a vehicle for learning about Filipina/o American culture and history as well as for building community among its student participants. I will focus my discussion on the University of California, Santa Barbara, a school with a rich PCN tradition despite its relatively limited cultural resources for Filipina/o Americans. Through my analysis I hope to reveal the social impact of the PCN on its participants and present the various thoughts, issues, and interactions they share through the unique experience of the Pilipino Cultural Night.

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Limpets vs. Mussels: Persistence in Maintaining Patch Mosaic Effects Mediated by Long Time-Scale Biotic Interactions

C. Marino

C. Blanchette – Marine Science Institute

In the past hundred years *Lottia gigantea* a common marine intertidal mollusk, has been the focus of territorial behavioral studies along the California coast. *L. gigantea*, the owl limpet, is seen as an important species for the maintenance of community structure and a contributor to the heterogeneous patch mosaic of algae and invertebrates seen in the intertidal. This study investigated the changes in patch size of *M. californianus* following *L. gigantea* removals. Observations of the interaction between *L. gigantea* and *M. californianus* were observed across fourteen paired control and removal plots at a single site outside of Lompoc, California. Every three months over an eight-year period the plots were sampled via in situ counts/removals of *L. gigantea* and digital images were taken of each plot. Measuring the difference in surface area that the mussels occupied at plots where limpets were removed versus control plots that remained untouched quantified the interaction relationship. At every removal plot, the surface area *M. californianus* occupied was larger than the control plots. The pattern of higher mussel density inside the manipulated plots versus inside the control plots remained constant over the course of the study period.

Using Mass Spectroscopy to Characterize Fluorescence of Silver Nanoclusters Bound on DNA Molecules

K.E. Martin

E. Gwinn - Physics

When synthesized on particular DNA sequences in solution, silver atoms form nanoclusters which exhibit fluorescence at wavelengths that depend on the specific DNA strand used in the synthesis. (B. Gwinn, et al). Understanding the factors governing the wavelength, intensity, and stability of Ag:DNA fluorescence is desirable for developing applications for this sequence controlled behavior. Previous experiments on the eleven-base DNA sequence TGGGGGGGGGT (TG9T) have shown this strand,

when bound to silver, to exhibit an atypical single peak of fluorescence. The goal of my experiments has been to elucidate the factors that lead to this strong, single fluorescence peak associated with the TG9T sequence. Using fluorescence spectroscopy, two aspects of the Ag:DNA solutions were varied in characterizing the fluorescence of Ag:TG9T, specifically the concentration ratio of silver atoms to DNA molecules, and the age of the Ag:DNA solution following the synthesis. Over the range of concentration ratios studied and for the post-synthesis times observed, the highest ratio of silver atoms to DNA molecules yielded the more intense, well defined, and stable fluorescence peak than the lower concentrations. Neither result was expected. Typically, increasing the silver to DNA ratio introduces new fluorescence peaks, which suggests that the long run of G bases forms a geometry that strongly favors stabilizing this particular Ag:DNA complex. The variation of stability with concentration ratio is surprising and provides evident of some sort of cooperative, stabilizing interaction of multiple emitters. Further experiments are needed to confirm these hypotheses, as well as results.

Promoting Positive Peer Relationships in Schools

N. Martinez

S. Jimerson – Gervirtz Graduate School of Education

Bullying in school has been a major topic of concern for researchers over the past two decades. There have been numerous studies done about the nature of bullying in school and also the effectiveness of different bullying prevention programs. The Promoting Positive Peer Relationships (P3R), Stories of Us, is a bullying prevention program designed to support students, educators, and the community working in concert to prevent bullying in schools. The program was developed by three leading specialists in 2008 and since then it has been implemented in 22 states and five countries. The key components of the program are the classroom curriculum resources, professional development curriculum resources, and community/parent education resources. However, little scientific research has been done in trying to statistically document the effectiveness of the P3R program. Thus, Dr. Shane Jimerson, one of the three leading specialists involved in developing the program, in collaboration with his research team are working diligently to gather data to investigate the efficacy of the program. The work examines the program's achievements

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in generating knowledge and providing the positive influences which impact students' attitudes towards bullying. This assessment will be carried out by formatting pre- and post-questionnaires and using measurement scales, such as the semantic differential scale and nominal scales. By doing quantitative and qualitative research, we will examine a change in the children's perception, behavior, and attitude towards bullying and also changes in their knowledge about the resources available when witnessing and experiencing bullying. Lastly, an overarching goal is to prevent and reduce bullying and create a more positive climate for the children.

Synthesis of 9,9'-bifluorenylidene

S. Martinez

F. Wudl - Chemistry and Biochemistry

The growing need for more environmentally friendly materials has driven the development of organic substitutes for many traditionally inorganic electronics. These special organic materials can carry electrical current, convert light into electricity and be used as light sources. A common stumbling block in this field is that many organic compounds tend to preferentially carry either positive or negative charge carriers, which limits the effectiveness of the finished devices. 9,9'-bifluorenylidene, a small organic molecule, readily accepts additional electrons. However, when it is electrochemically polymerized it is reported to accept and give up electrons. Materials with this special property are referred to as ambipolar compounds, and are highly sought after in the field of photovoltaics. In this work 9,9'-bifluorenylidene was synthesized, and the electropolymerization repeated to try to create the ambipolar polymer on a larger scale for potential device applications. The synthesis was successful, yet the electropolymerization was found to be irreproducible. Batteries composed of 9,9'-bifluorenylidene have been tested by CV, but the results have not been what expected. The batteries have been shown to discharge two electrons but when recharged only one electron is accepted. Therefore there is still further testing to be run on the 9,9'-bifluorenylidene before it can be called a quits on its function as a compound for organic batteries.

Valuing Virtue: The Act of Seduction

C. Mason

P. Cohen - History

As nineteenth-century American society stressed moral reform and the suppression of sexuality, seduction actions were established as a unique method of legally restraining illicit sex. Seduction actions were legal suits brought forth by fathers and masters, under tort law, against seducers for the seduction of their daughter or servant. Charges established were "loss of service," as distraught young women were incapable of work as a result of their seduction. In order to understand seduction, and seduction actions, I have researched the Gale Group database, "Nineteenth-Century U.S. Newspapers," to analyze not only attitudes towards seduction, but also the actual execution of seduction actions and its progression throughout the century. In analyzing the newspaper database, seduction actions are the foundation of the larger phenomenon of seduction. Seduction emerges in the sensationalized press reporting on seduction actions published by James G. Bennett and the New York Herald, and adopted by the moral reform movement, including the New York Female Moral Reform Society. Ultimately, criminalization was achieved with the support of middle-class society and the newspapers themselves. This criminal status, demonstrated recognition by both newspapers and the legislative process that young women were in need of legal protection from libertine males. An integral part of nineteenth-century sexuality, seduction action is an essential study as it reinforces the idea of restricting illicit sexuality through the establishment of legal procedures, while concurrently depicting the female as victim and the male as the sexually licentious libertine.

Tsimane Personality

M. Massenkoff

M. Gurven - Anthropology

This poster presents findings from personality surveys administered to the Tsimane, a forager-horticulturalist group living in Bolivia. The project has three major goals. First, we test for the emergence of the Big Five personality factors in the Tsimane. While the Five Factor Model of Personality is well supported in Western cultures, it has been less successful in underdeveloped countries. Our results will

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contribute to an ongoing examination of the Big Five's universality. Second, the poster examines how personality varies with age, sex, birth order, and fertility. Significantly, this will entail one of the first empirical tests of the prediction that different personality profiles engender different fitness outcomes. Finally, we investigate whether residence in a particular village is a contributor to personality variation. Personality may be as much the result of individual-level attributes as the outcome of dynamic cultural influences.

State Department Policy in Nicaragua, 1909-1928

R. Maxwell

F. Dutra - History

From 1909-1933, Nicaragua experienced a period of protracted unrest and several revolutions; events that deeply troubled the United States. Marines were dispatched to Nicaragua to protect American nationals and interests while the U.S. State Department tried to find a diplomatic solution to re-establish stability. Ultimately, the application of diplomatic recognition of Nicaragua demonstrated that the seeds for the intervention's failure lay in the State Department's policies themselves. Unlike previous scholars have suggested, this failure was not due primarily to State Department condescension and paternalism, a fundamental misunderstanding regarding the nature of Nicaraguan politics, or because Nicaragua simply was not ready for stable democratic government. Instead, close analysis of State Department records, the accounts of several important Nicaraguans, and examination of the primary source material contained in the National Archives revealed that the State Department's undoing was contained within its own contradictory policies. The State Department's unequal adherence to the Treaties of 1907 and 1923 created instability that nullified any benefits garnered from having a pro-American government installed in Managua. In addition to causing grave misunderstandings through its aberrant applications of the Washington Treaties, thus encouraging revolution when this was the last thing intended, the State Department was also bedeviled by its own inability to ensure competent personnel in the field and to obtain accurate information.

A Process Analysis of the Nigerian Civil War T. McHugh

C. Kaplan - Political Science

As inter-state conflict has declined, the international community has shifted its focus to civil wars. Conventional wisdom holds that civil wars are the result of deep-seated religious and ethnic divisions within societies. Two general approaches, rational choice and culture theory, dominate current scholarship. This paper depicts the general arguments of these approaches and critiques their associated models in order to demonstrate the need for an alternative approach in the study of ethnic conflict and civil war and employs a process analysis in order to identify the causal chain of events that led to the initiation of conflict. This analysis examines the critical case of the Nigerian Civil War. A process analysis tests the validity and robustness of the aforementioned approaches, as well as provides the analyst with a more complete causal explanation. This study of the Nigerian Civil War contributes to the literature by broadening the scope of analysis to include a wider range of factors active in causing the conflict. The primary factors that caused the war were political violence during 1965 and 1967, the politicization of ethnic groups and the creation of ethnic regional political parties, and corruption within the federal government. A formal model is diagrammed at the conclusion of the paper, which can be generalized and applied to other civil wars in an attempt to identify causal factors.

Attitudes and Behaviors Towards File Sharing C. McSweeney

C. Mullin - Communication

Illegal peer to peer file sharing among university students has become an increasingly important issue for the entertainment industry and policy makers. Previous research has shown that strict university policies, legal and financial risks and ethical considerations regarding illegal file sharing do not effectively deter students from engaging in said behavior. This study examines how college students process different types of persuasive messages designed to alter perceptions and behaviors pertaining to illegal file sharing. One hundred and fifty UCSB undergraduates initially completed an online survey designed to assess attitudes and behaviors about downloading. Participants were

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randomly assigned to one of four conditions each containing a different “anti-file sharing” newspaper article. These articles either incorporated a one or two-sided persuasive message discussing the ethics of illegal file sharing, or a one or two-sided message emphasizing the legal risks that illegal file sharing entails. One week later, participants took an online follow-up survey designed to assess whether participant exposure to any of these four articles could be linked to changes in key attitudinal or behavioral variables. Two hypotheses were posed by the researcher. First, two-sided messages will be more effective for subjects who processed the articles in a systematic manner as opposed to a heuristic manner. Second, the extent to which a subject processed the message systematically or heuristically would be a function of personal characteristics like the extent of their downloading behavior. Furthermore, the researcher will be looking for personality variables which predict differential responsiveness to an ethics or risk-oriented message.

Synthetic Approach Toward Telomerase Inhibitor: Beta-Rubromycin and Structurally Similar Unsymmetrical Naphthoquinone Natural Products

E. V. Mercado

T. Pettus - Chemistry and Biochemistry

Natural products have long been regarded as “nature’s medicine cabinet” providing a rich source of leading compounds for pharmaceutical development. Natural product synthesis is an enabling science because it provides an opportunity for discovery at the interface between biology and medicine. Therefore, the development of a unifying synthetic strategy targeting similar natural products becomes beneficial to many fields. Beta-rubromycin, isolated from cultures of *Streptomyces*, has shown potential inhibition toward human telomerase and is therefore therapeutically probable as a viable cancer treatment. On the other hand, many unsymmetrical naphthoquinone natural products are recognized today as displaying antimicrobial, antialgal, cardio-protective and antioxidant biological properties. In 2009, the Pettus research group devised a synthetic strategy for the construction of the unsymmetrical naphthoquinone portion on Beta-rubromycin and subsequently utilized one intermediate for the formal syntheses of both boryquinone and hybocarpone as well as for the

first total synthesis of malvone A. This study has focused on expanding the effectiveness of this versatile strategy in the construction of similar unsymmetrical naphthoquinone natural products christazarin, echinochrome A, and echinamines B. The crucial intermediate used as a launch pad for the three compounds is synthesized in six-steps from the starting material, 2-ethyl-1, 3, 4-trimethoxybenzene. From a synthetic standpoint, the success of this strategy provides a practical route for the synthesis of biologically active natural product families containing the unsymmetrical naphthoquinone backbone.

Coalitional Politics in Student Movements

P. Monge-Rodriguez

G. Lipsitz - Sociology, Black Studies

This study investigates the dynamics of coalitional politics in contemporary student movements. Specifically, it observes the Californian student movement in defense of the public education system. Currently there has been little scholastic knowledge developed on the unfolding student movement due to its recent advent. Research on present student movements, particularly those centered on public education, remain overshadowed in Social Movements Studies by more extensive research available on the student movements from the 1960’s through the 1990’s. Also, most literature on these movements only concentrates on their impacts and outcomes, overlooking the importance of their organizational structures to the achievement of those outcomes. Moreover, emerging literature on the organizing tactics and structures of student movements leave out important examples from the current movements. In examining the organizational structure and strategies of the modern student movements to defend public education, this study will explore a virtually unstudied dimension of the history of student movements, while furthering the understanding of organizing and the coalition tactics of student movements as a whole. Specifically it asks: what are the most effective tactics in building and sustaining coalitions in the current student movement? What organizational approaches undermine the cohesiveness of these coalitions and cause them to fail? Taking a participating, observer research approach, this study bases its findings on collected data from a series of coalition meetings aimed at addressing the effects of the budget crisis and its effect on public education.

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Drugs and Politics, a Violent Combination

M. Moore

K. Bruhn - Political Science

The current drug war in Mexico has consumed many lives and dramatically increased violence throughout the country. It has also captured some of the most powerful drug cartel members and seized a large amount of drugs. Mexican President Felipe Calderón has been both applauded and criticized for his handling of the drug war. The human cost of the drug war is quite clear, but the political cost (or benefit) of the drug war remains illusive. I hypothesize that President Calderón chose to fight a war on drugs in order to gain legitimacy after a controversial election, and that though the war on drugs was popular when it was undertaken the increase in violence and lack of concrete results has damaged President Calderón's political career as well as damaged his party's prestige. My data will demonstrate that President Calderón's party lost more power in states that have been targeted in the drug war, which will be measured in military presence, number of local political leaders who have been prosecuted on corruption charges, and number of homicides per 100,000 people. If Calderón's PAN party has indeed lost power in states that have been affected by the drug war, then we must then examine whether President Calderón made the right political decision by going after the drug cartels.

Autonomous Robots Exploration Methods

A. Morales

F. Bullo - Mechanical Engineering

The motivation in developing searching algorithms is to ultimately implement them in teams of search and rescue robots, as well as in locating bombs and other security applications. In the field of autonomous mobile robotics, the search or pursuit-evasion problems have generated a lot of interest. In searching problems, one or more searchers must efficiently sweep a map to detect the target. Our focus is on implementing a searching algorithm for a single robot and a static unknown environment laying a foundation for solving pursuit-evasion problems, and cooperative searching. The problem of having the most efficient means of traversing an unknown map, was addressed by creation of a graph of the explored regions, which made possible

a method of navigation for the searcher. The frontier, the border between the explored and unexplored, was used to determine which positions are available to move next. The next position was determined by the amount of frontier covered as the searcher moves. By creating nodes of positions of the robot throughout the map, the graph of the environment was constructed. Incorporating in-depth first traversal of this graph made for a faster search. Our algorithm was simulated in the Player/Stage robot programming interface, and uses Multi-robot-Integration-Platform (MIP) to develop our robotics algorithm. The algorithm used the distance sensor mounted on robots to create the frontier. The case where the robot had a field of vision of 360 degrees and a sensor range of 5 meters was studied, this lays a foundation for multi-robot searching.

Health Care: Through the Eyes of Black Women

I. Morgan

E. Boris - Feminist Studies

My research project focuses on how black women's organizations advocate for and advance health care issues within the black community. Black women have long engaged in health care activism through their own organizations. Clubwomen in the 1910s in Atlanta, for example, sought to clean neighborhoods of trash, plant gardens, and pressure authorities even under segregation to pave the streets and install sewers. During the 1930s, sororities brought traveling health care clinics to rural Southern areas to fight diseases of poverty and provide primary health care. These women in the past focused on infant and maternal health. My plan is to illuminate this involvement and highlight its shifting contours over time by conducting a literature review in the United States during the late nineteenth, twentieth and twenty-first centuries in order to form a historical timeline of activism and a website analysis on three organizations, two in California and one national group to establish current activism. My research has found that there is a long history of activism by black women for better health care conditions. The women offer an alternative definition of health care which includes mind, body, and spiritual elements. This research is significant in understanding how black women have played a role in the health care movement. It is a vital issue as the nation is reconsidering health needs and the delivery of health care.

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Breaking through Bars

A. Munoz

S. Falasca-Zamponi - Sociology

This research counters the notion that incarceration and criminality are an inherited fate and that children of incarcerated parents merely perpetuate their parents' criminal cycle by following in their footsteps. In contrast, it argues that children of incarcerated parents are often independent, resourceful, and resilient individuals who have the ability to overcome many obstacles. Using college as a marker of success in a young adult's life, in-depth interviews were conducted with college students of incarcerated parents. Findings show that these students are able to break the "cycle" and do not follow their parents' path. Findings also show that besides self determination, these students' success is due to outside support in the form of academic programs such as AVID, proper functioning foster care services, as well as encouragement from teachers and family members. In conclusion, this study offers evidence that children of incarcerated parents are not necessarily future problems for the criminal justice system, as commonly assumed. In addition, the study suggests that more should be done to ensure that children growing up in similar situations have the resources and opportunities to be able to choose a different path from the one taken by their parents.

Nautical Dangers: A Counter-Piracy Policy Evaluation

A. Muñoz

R. Rauchhaus - Political Science

This project studies three specific cases of maritime piracy in the Barbary States, the Strait of Malacca, and Somalia in an attempt to determine patterns of successful counter-piracy strategies. Included in this study are six possibilities for anti-piracy action: (1) International Military Coordination, (2) Unilateral Military Action, (3) International Legal Action, (4) Regional State Capability of Law Enforcement, (5) Negotiation, and (6) Private Shipping Security Measures. Content analysis of historical narratives, government documents, and current domestic and international reports on piracy is coupled with this strategic framework to produce an overall counter-piracy policy

evaluation. Preliminary results indicate that the methods of negotiation and private shipping security measures will be the least successful in reducing acts of piracy and could potentially have an inverse effect, increasing the likelihood of attacks. While international legal action and regional state capability of law enforcement could theoretically produce effective regulation of threats on the high seas, problems in the international legal framework and the large obstacles for securing regional capability prevent these methods from being successful in practice. The most effective strategies for anti-piracy action should lie within international or unilateral military efforts to produce effective waterway patrols. Using the results of the evaluation, a policy suggestion will be projected for Somalia's current situation of piracy in the Gulf of Aden in the concluding thoughts of this study.

Coating Processes for Organic Photovoltaic Devices

A. Munoz

J. Cochran - Chemistry and Biochemistry

Organic photovoltaic cells represent a potentially low cost solution to the need for generation of electrical power from solar radiation. These photovoltaic devices currently achieve power conversion efficiencies of approximately 5% whereas efficiencies of greater than 10% are desirable for large-scale adoption of solar energy conversion. Currently, the most efficient organic photovoltaic cells are fabricated as bulk heterojunctions. A bulk heterojunction comprises a phase-separated blend of a light absorbing organic polymer and an electron accepting (or donating) material. Because the exciton only diffuses a short distance, typically ~5 nm, the phase-separated domains must be on the order of 10 nm. Control over nanoscale phase separation in blends of semiconducting polymers has been difficult to achieve due to the complex phase behavior. Current coating methods are unable to control nanoscale domains and they lack the ability to modulate and control a wide range of coating parameters. Blade coating is a promising method to fabricate polymeric photovoltaic devices. Unlike spin coating, the substrate temperature and solvent environment can be controlled easily. Additionally, the blade can be nanopatterned which may enable nanoscale control over phase segregation. Relatively little, however, has been done to examine the phase separation process of semiconducting polymers using this technique. The

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first step towards studying the blade coating method is to construct an instrument that enables temperature control of the substrate. The project will comprise designing the motion control system and heating stage followed by characterizing the resulting photovoltaic devices fabricated with the system.

Isolating Fluorescent Ag:DNA Molecules Through Hybridization with Complimentary DNA Strands

J. Murillo

E. Gwinn – Physics

Short synthetic DNA oligomers have been shown to stabilize few atom silver nano-clusters in aqueous-solution (Petty, 2004) forming Ag:DNA fluorophores whose sequence and structure dependent wavelengths range from the ultra violet to near infrared (Gwinn, 2008). Ag:DNA fluorophores hold promise for optically-functional nano-elements within larger DNA scaffolds. Given the recent innovations of DNA origami demonstrating the possibilities for precise, self-assembled nano-scale constructs and the preferential stabilization of Ag:DNA by single stranded DNA (Gwinn, 2008), the fluorophores could form the basis of nano-scale optical-arrays with potential uses in future information-processing technology. I have been working with my group to understand the photo-physical properties of these fluorescent Ag:DNA molecules. Unfortunately, the synthesis process inevitably produces a heterogeneous mixture of many Ag:DNA species (ranging from one Ag-atom bound to over a dozen) of which only a few are fluorescent. The challenge we thus face is separating fluorescent Ag:DNA from non-fluorescent species. I have been examining the introduction of DNA, which is complementary to the Ag:DNA host, to fluorescent solutions as a possible means of overcoming this challenge. The hypothesis is that the fluorescent Ag:DNA complexes will be too tightly bound to allow the DNA host to bind its complement, but the non-fluorescent species should have more free bases for complimentary binding. These new, larger complexes would then have very different physical and/or chemical properties from the fluorescent Ag:DNA's, allowing efficient separation. I found that a fully complimentary strand does bind, but not insignificant amounts. However, the binding was species-specific which lends weight to the overarching idea and suggests that a shorter complimentary sequence, which binds more easily, may still fulfill our desired goal.

Biological Control of the New Zealand Mud Snail

G. Navas

R. Hechinger – Marine Science Institute

A. Kuris – Ecology, Evolution, and Marine Biology

The New Zealand Mud Snail (NZMS) *Potamopyrgus antipodarum* has recently invaded the United States, where it sometimes reaches densities of more than 40,000 snails per m². The lack of an efficient predator and the parthenogenic reproduction of the females have enabled this freshwater snail to invade rivers and freshwater streams potentially outcompeting native snails. Studies suggest that control of *P. antipodarum* could be achieved by *Microphallus* sp as this parasitic trematode might regulate the populations of *P. antipodarum* by castrating the snails. This study examined the relationship between shell length and body mass on preserved snail samples previously collected from throughout New Zealand. This relationship in combination with data on reproductive output will allow us to calculate the biomass of NZMS populations and the effect of *Microphallus* sp. on the reproductive output and population biomass. The goal of these analyses is to design models that will enable us to predict whether or not a biological control of the invasive New Zealand Mud Snail can be achieved in the United States through introduction of *Microphallus* sp.

Fort Ross and Comparative Frontier Histories

C. Nelson

R. Busto - Religious Studies

Russia's presence in North America during the eighteenth and nineteenth centuries is not generally well known. The realm of Russia's unique frontier in the Americas stretched from Alaska to Latin America, and is an undeniable part of the history connecting the United States and Russia. The most prominent monument in the continental United States celebrating this time period is Fort Ross, quickly approaching its two-hundredth anniversary. Nestled in the coastal hills less than 100 miles north of San Francisco, Fort Ross, a California State Park, now faces one of its greatest challenges. Among other cities and institutions facing closure throughout the state of California, as a consequence of the recent budget crisis, the Fort stands out for

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the unique international attention it has received. More specifically, this attention has come from Russian officials who are involved in talks with Fort Ross administrators and California officials suggesting possible Russian financial support to keep the park open. If one delves deeper into the history of Fort Ross, the inter-connectedness of the frontier histories of Spain, Mexico, England, Russia, and the United States are brought together. While there exists a historiography on the fort itself as well as studies on California in regards to the interplay between various colonial powers interested in the resources it offered, much can be added by exploring the distinct similarities and differences that are noticeable when comparing the frontier histories of Russia and the United States.

Implicit Cognition of Collective Action

J. Nemirow

L. Cosmides - Psychology

Collective actions, multiple individuals coordinating their behavior to produce a shared good, are ubiquitous across human societies. Although the benefits collective actions create are greater than what any individual could create working alone, from a rational perspective contributions to collective actions are often puzzling. This is because many collective actions produce a good that allows free riding. Non-contributors can free ride on others' contributions by taking the benefit without paying the cost, leading to non-contributors receiving higher payoffs than contributors. Other collective actions do not have this problem; in these cases, non-contributors cannot free ride. Regardless of whether free riding is possible, however, non-contribution by others reduces the benefits available to contributors. Adopting an evolutionary psychological perspective, we ask: First, do non-contributors in general generate negative sentiment (e.g., to motivate them to contribute)? Second, due to asymmetries in payoffs for contributors and non-contributors, do non-contributors who can free ride generate greater negative sentiment than non-contributors who cannot free ride? In three studies employing implicit behavioral measures, we demonstrate the existence of both of these effects. We show that the mind: (1) is highly sensitive to the distinction between contributors and non-contributors, (2) ascribes negative moral evaluations to non-contributors, (3) is sensitive to the nature of the good being produced by the collective action and modulates its response accordingly, generating greater negativity when

the non-contributor is also a free rider. These findings provide further empirical evidence for the existence of psychological mechanisms that have evolved to enable human collective action.

Quantitative EFM for Solar Cell Characterization

K. Nguyen

T. Nguyen – Chemistry and Biochemistry

My project goal is to modify a commercial EFM instrument to obtain quantitative data that is useful for organic solar cell materials. To obtain quantitative EFM results, we will separate the signal using two lock-in amplifiers, a function generator, a dc power source, a voltmeter, an oscilloscope, a signal access module, and a nanoscope extender box. We will need to connect all these into a commercial scanning probe microscope. With the aid of the lock-in amplifiers, the magnitude of charge and the dielectric properties can be determined from the probe frequency shift. A better understanding of the local surface charge and dielectric properties as a function of processing conditions and light intensity is crucial for producing efficient solar cells.

NiTi Shape Memory Alloys and Cross sectional STM

M. Nguyen

C. Palmstrom – Electrical and Computer Engineering, Materials

The ultimate goal of the thermoelectrical research being done in Christopher Palmstrøm's lab is the focus on efficiency of energy stored in certain materials and being able to convert them into useful energy by the properties of the semiconductor. Working with different materials will change the efficiency of the energy absorption. This particular smaller project experiments with three different types of materials, nickel titanium, growth on magnesium oxide, and examining cross-sections of materials like gallium arsenide and erbium arsenide. Another side project being done is with MgO and alloying it with TiTiX. The steps to this procedure consist of loading MgO and adding a thin ebi film into the vacuum chamber.

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Selective Electrocatalysis of HBr

R. Norton

E. McFarland - Chemical Engineering

For the production of renewable energy an integrated system for the conversion of methane to gasoline and hydrogen has been proposed. The catalytic process for converting methane (CH₄) and bromine (Br₂) to light fuels ("C₈H₁₆"), such as gasoline, and hydrogen bromide (HBr) combined with a process to regenerate the bromine from the HBr using a solar photoelectrochemical (PEC) process will provide more fuel energy output at higher efficiencies than the conversion of methane to gasoline using Br₂ without the electrochemical recovery of bromine using the coupled PEC process. To minimize the capital cost of a particulate based slurry PEC reactor is suggested which would make use of individual PEC particles that absorb light and have both anodic and cathodic sites to oxidize the Br⁻ and reduce the H⁺. The disadvantage of the slurry reactor is that Br₂ may be reduced at the cathode sites forming HBr as a back-reaction product; lowering PEC system efficiency. To minimize the back-reaction and provide a method for Br₂ extraction, several organic compounds have been studied in order to bind the Br₂ in solution for extraction. Polyethylene glycol (PEG) polymers Mw ~1000 g/mol have shown be successful in reducing the back-reaction and binding the Br₂ in solution. To further reduce the back reaction we are attempting to coat the cathode with a material that is permeable to H⁺ and H₂ and not Br₂. Creating this semi-permeable layer would provide a method for selective electrocatalysis, allowing only H₂ to be formed at the cathode.

Ezili Danto: Carving Spaces for Sexuality and Gender Discourse in Haitian Religion

E. Nwokocho

N. Clitandre, R. Strongman - Black Studies

In Haitian Vodou, to serve the venerated Petwo Deity (Lwa), Ezili Danto, is asking for strength, power, healing, wealth, and protection. She is held in such high regards that the blue on the Haitian flag is dedicated to her spiritual greatness. Her "protectress" characteristics and womanhood have been praised and widely accepted while her sexuality is taboo. Scholars who study Haiti and its national

religion as well as practitioners themselves have rarely discussed matters of gender and sexuality. Using an inter-sectional analysis, this project argues that Danto's sexuality is as important as her strength and her association with motherhood. This study examines already published scholarly work on Vodou and on Ezili Danto as well as utilizes interviews with Haitian Vodou practitioners and scholars to consider how Danto's sexuality can be taken into account. Providing a space to talk about sexuality within the Haitian religion allows people such as lesbian, gay, bisexual, transgender, or intersex (LGBTQI) a means to express themselves within the boundaries of a spirituality that accepts them fully and acknowledges their whole self. However, the challenge remains the discrepancy between the praxis-Vodou's acceptance of various sexual orientations and the fact that most practitioners are still uncomfortable theorizing notions of gender and sexuality within the religion. This re-analysis also questions fixed gendered identities grounded in conventional understandings of sexuality. Danto, a complex figure that is fluid and multifaceted, provides an invaluable perspective for probing gender relations in Haitian society and opening new spaces of understanding in the realm of sexuality.

Closeness in Romantic Relationships

S. O'Keefe

S. Gable - Psychology

This study investigates how closeness and inter-connectedness in a romantic relationship may influence social comparison. In previous studies, when a close other out-performs you in a domain that is not self-relevant, you are likely to respond with constructive behaviors, but if the domain is self-relevant, you may feel threatened by their success and respond with destructive behaviors. Our hypothesis is that when levels of closeness are high, even when one's partner out-performs them in a self-relevant domain, one will still respond with positive behaviors instead of more negative one's that imply feeling threatened. This is because the closer one feels to their partner, the more difficult it is to separate oneself from their partner cognitively, because one's identity becomes merged with the identity of the partner. In this study, couples came into the lab and completed questionnaires and a problem solving task called the Desert Survival task, which we primed as either self-relevant or irrelevant. After completing this task, both members of the couples were told their partner

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scored in the 95th percentile and they scored in the 60th percentile. The couples then were asked to write a message to their partner, which they were told their partner would receive later in the study. These messages will be coded to see how participants reacted to their partner's success in the problem solving task. Some measures were repeated at the end of the study to see if the participants were at all influenced by their partner's success.

The Intriguing Meaning of Gender

A. Pangelinan

P. Spickard – History, Asian American Studies

My research is on the third gender community found in the Pacific commonly known as Mahu. The third gender identity is also known as other names on various islands throughout Oceania. My question ponders whether culturally specific gender roles like the third gender Mahu are able to transcend community and space when in America. My research methods have included research on the LGBTQ community, gender, and diaspora through journals, blogs, academic articles and films. I have also conducted several interviews with people involved in the Pacific LGBT Community who work with this subject. I have found in my research so far that, in fact, Mahu and other culturally specific third gender identities are not able to survive in America due to strict social standards on gender and LGBT issues, as well as a lack of representation of Pacific Island Culture. In turn with this research, I have also seen the overall degradation of Pacific and Oceanic cultures in America is continuing through this gender and culture suppression both in American and on the Islands in the Pacific influenced by America.

ABI4:Regulator of Plant Stress Response

M. Petitfils

R. Finkstein – Molecular, Cellular, and Developmental Biology

Global climate change and an increasing population are causing high demands on agriculture. One way to meet these demands is to make crops more tolerant to stresses such as drought and salinity. To do this effectively, it is important to understand how plants respond to stress hormones such as abscisic acid (ABA). In this project we

are trying to understand the regulatory network of a gene involved in ABA response called ABA-insensitive (ABI)4. In order to understand how ABI4 activity is regulated, we measured transcript and protein accumulation in transgenic plants producing ABI4-GUS (B-glucuronidase) fusion proteins. We did a Northern Blot to find the amount of ABI4-GUS RNA transcript produced. We used a fluorometer to measure the amount of ABI4-GUS activity, which reflects ABI4-GUS protein levels. To assay protein stability, we used cycloheximide to inhibit new protein synthesis and measured how much ABI4-GUS protein remained in the plants' cells. We found that ABI4 is highly regulated post-transcriptionally, that full length ABI4 has a half-life of about 5 hrs, and that many different parts of ABI4 are unstable. More work needs to be done on how and when the plant destroys ABI4, and why certain parts of ABI4 are more unstable than others.

Political Campaign Websites and Young Voters

C. Presentati

M. Stohl - Communication

Today, young American voters are turning out to the polls in lower numbers than older Americans and young voters of previous generations. In addition, young voters are turning away from traditional media sources for their political information, in favor of the Internet. Given this recent phenomenon, this project explores the effects of interactive political campaign websites on young voters' political knowledge, internal political efficacy, external political efficacy and mobilization. To compile data for this project, the researcher of this study conducted a pretest-posttest experiment. Participants were randomly assigned to one of three conditions. In the first condition, participants viewed televised ad campaigns for the 2010 California Gubernatorial Primary Election. In the second condition, participants viewed the interactive political campaign websites of the Gubernatorial candidates, and in the third condition, participants viewed interactive websites and contributed their own political opinions in the form of a blog on the political website rockthevote.com. The researcher of this study hypothesizes that young voters who are exposed to highly interactive political media and who contribute their own political opinions online will exhibit higher levels of political knowledge, efficacy and mobilization than young voters who are exposed to traditional televised political campaign material.

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Determination of Viral Production Rates in a Marine hydrocarbon Seep

S. Quistad

D. Valentine – Earth Science

Viruses are an integral part of all marine ecosystems and they outnumber all forms of cellular life combined by roughly an order of magnitude. With an estimated 1023 viral infections occurring every second in the ocean they are a major source of mortality as well as a driver of the evolution of both host and viral assemblages. While studies have been conducted to document their vast genetic diversity, few have investigated rates of viral production linked to specific biogeochemical processes. In this study we examine the rates of viral production in a methane-consuming microbial population extracted from a cold-water marine seep utilizing a stable isotope probing approach. Sediment samples were removed by SCUBA from Shane Seep, located in the Santa Barbara Channel, and slurries were created. Incubations were conducted using ^{13}C -labeled methane and viral DNA was subsequently extracted and purified. DNA was analyzed using isotope ratio mass spectrometry for ^{13}C -enrichment and using those data, rates of viral production will be determined. Our results will push the field of marine viruses from broadly descriptive towards characterization of the viral-host dynamics of a specific community.

The Race for Love: Negotiating Differences in Interracial Relationships

M. Reul

S. Falasca-Zamponi - Sociology

In a society as diverse as the United States, people are bound to interact and build relationships with others of different races. These relationships frequently take the form of romances, giving way to interracial dating and coupling. In spite of diversity, however, many Americans hold preconceptions about other races and generally oppose romantic relationships between people of different races. This research examines the pressures that interracial couples face and the ways they negotiate those pressures in their everyday lives. Data was gathered through personal interviews with individuals and couples involved in interracial relationships as students at the University of California,

Santa Barbara. The study originally hypothesized that individuals involved in interracial relationships face significant outside pressures and disapproval in regard to their choice of partner. The interviews, in contrast, showed lower levels of tension and disapproval than expected, yet they confirmed that those who experience opposition develop a variety of strategies to maintain connections with family and friends who disagree with their choice. For many, being in an interracial relationship requires emotional strength and determination in order to keep their romantic involvement with their partner alive while also ensuring that relationships with family and friends do not dissolve.

Exploring Organizational Identification

E. Richardson

K. Myers - Communication

Organizational Identification (OID) is a form of social connection in which the individual feels a sense of belongingness or attachment to a particular organization (Mael & Ashforth, 1988). Members' identification is crucial for the continued success of many different types of for-profit and non-profit organizations. OID causes members to engage in extra-role citizenship behaviors, perform and make decisions that positively impact the organization, and retain membership. OID causes former members to speak highly of the organization, participate in activities, and even make donations. This study investigates the OID of university students. Qualitative and quantitative survey data was collected from 555 juniors and seniors at a public university. Several hypothesized factors were significantly positively correlated with OID, including: students' trust in the university, their construed external image of their university, their communication engagement in with the university, their satisfaction with the university in contributing to their goals, and their perception of interorganizational competition with other rival schools. Small positive correlations were found between OID and students' wearing UCSB apparel and having a mentor on campus. Relationships were not found between students' OID and their feelings about the recent budget crisis, and students' participation in university sponsored groups and extra-curricular activities. Open-ended responses indicated that students felt their OID was positively enhanced by things like attendance of university sponsored social events and sports games, but negatively affected by the effects of the recent budget crisis and by negative experiences with university sponsored social events.

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Nitride-based LED and Photovoltaic Devices

C. Roberts

C. Van de Walle - Materials

Research on nitride-based high-efficiency light emitting and photovoltaic devices are pushing the materials used into extremely challenging areas, including the growth of InGa_N with very high indium concentration and the fabrication of layered structures that exhibit large strains and large quantum confinement. Modeling of the materials and devices can often be very helpful and complementary to the experimental effort. The Van de Walle (VdW) group performs first-principles calculations that can provide highly useful information at the atomistic level. To optimally take advantage of the results, and to provide a stronger link to experiment, I am planning to perform macroscopic device simulations at the quantum mechanics level. By implementing the most recent band parameters of nitride compounds obtained by VdW group, I will examine the imperative problems for optoelectronic devices, including, for example, the polarization switching in semipolar InGa_N based LED. My primary results indicate that this profound effect might come from the quantum confinement effect in thin quantum well. I am conducting investigations on how the In composition, orientation and quantum well width correlate with the polarization switching. Furthermore, I will study the loss mechanisms of LED and laser devices concentrating on Auger and other recombinations. Recent work in the VdW group has shown that the rates for these processes are very different from those predicted by models that were developed for conventional semiconductors. Implementing this improved description of loss processes in the simulation code will allow for a more accurate assessment of the impact on photovoltaic and light emitting devices.

Properties of a Black Hole in 2+1 Dimensions

E. Roebber

D. Marolf - Physics

I examine in detail the properties of genus 1, non-rotating, single-exterior black holes in three dimensions. Such black holes have already been constructed by Åminneborg et al, and can be completely characterized by three independent parameters. These parameters are determined and

constrained using geometric and group-theoretical approaches, and physical interpretations of the parameters are provided. The properties examined include the horizon length and geometric features of the interior of the black hole.

Rejection Sensitivity and Conflict

C. Roukos

N. Collins - Psychology

Rejection sensitivity (RS) – the degree to which a person expects social rejection – is related to how people handle conflict and stress in their romantic relationships. High RS people often react negatively to conflict, whereas low RS people tend to react more constructively. This study examines whether a scientifically validated training task called the “find-the-smile task” (Dandeneau & Baldwin, 2004) can help high RS people handle conflict more constructively by reducing their concerns about rejection. The training task – in which people find a smiling face within a grid of frowning faces – is designed to change how people attend to their social environment by training them to look for “acceptance” rather than rejection cues. This task has been shown to help people become less concerned about rejection and to handle stress more effectively in their daily lives. In this study, we hypothesized that the training task could also improve the way people handle conflict in their relationships, especially people high in RS. Participants completed either the find-a-smile training task or a control task for 5 days at home. On the 6th day, they came into the lab with their romantic partner and were exposed to a mild relationship threat (they were led to believe their partner was writing about their flaws). We then assessed participants’ thoughts, feelings, and behavior toward their partner to determine if they treated their partner negatively or positively after the threat experience. Preliminary results provide mixed support for the hypothesis. Results and possible limitations will be discussed.

Abstracts—Individual Projects

Thermodynamic Analysis of DNA

Tile Assemblies

M. Rowley

D. Fygenon - Physics

The simplicity of Watson-Crick base-pairing allows for the rational design of complex DNA structures that self-assemble from simple nanoscale components. Among the largest, most rigid and most easily studied structures are DNA nanotubes. Nanotubes made from DNA tiles, simple motifs based on Holliday junctions, have been well characterized and are highly programmable. Here we report a new technique for monitoring specific sticky end connections between DNA tiles using a fluorescein label, the fluorescence of which quenches significantly upon sticky end dissociation. We apply this technique to measure nanotube melting curves, and demonstrate that the melting transition is absent in a control sample with the fluorescent label at an internal position within the tile. We also compare the fluorescence data to standard UV absorbance melting curves, showing that the fluorescence technique is highly selective for a specific transition and that the nanotube and tile melting transitions are well separated in temperature. Finally, we compare melting curves measured for smaller constructs made from the same tiles (tetramers and ladders) to determine the extent to which being constrained within a large lattice structure affects the melting temperature and transition characteristics of DNA tile interactions.

Creating a Corpus of Spoken Tagalog

C. San Jose

M. Mithun - Linguistics

Linguists from the past have studied languages primarily by looking at its written forms or direct translation. Although a lot of work has been accomplished through this method, much remains to be learned about real speech. By creating a corpus of spoken language, much more can be learned about languages and their use. Working with spoken language allows the researcher to discover many interesting patterns which would not be present in written forms. An example would be prosody. This corpus will provide an open-ended basis for my future work on almost any linguistic topic. By a lack of a research question, and by instead allowing speakers to produce their language to

take its own form naturally, we can discover more answers. This study demonstrates the procedure of creating a corpus of Spoken Tagalog, a language spoken in the islands of the Philippines.

Division of Labor and Childcare in Same-Sex Families

N. Scheidemen

B. Schneider - Sociology

Despite the vast amount of research on the household division of labor in heterosexual cohabitating couples with children and cohabitating lesbian mothers, little is known about how the labor of child-rearing is managed, divided, and agreed upon in gay male partnerships. Existing research illuminates that in most heterosexual households, the mother provides most domestic childcare. While research relating to same-sex households largely excludes childcare, occupational qualities and practical economic issues are the principal factors in determining who gravitates toward domestic labor. Such findings attribute the emotional labor of childcare to monetary or economic factors, largely ignoring possible components such as home ownership, pre-existing learned childcare or domestic skills, birth methods, legal guardianship, and biological parentage. This study attempts to determine what factors in addition to the economic and occupational are at play in determining how childcare is managed in gay male households. To ascertain the potential impact of these factors, I will take a qualitative approach in conducting in-depth interviews and observations of gay male households raising children. Case studies will be obtained using initial contacts at local LGBT organizations and a snowball sampling method. This study will increase the understanding of key factors in determining roles in childcare among cohabitating gay males.

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Mate Priming, Strength and Competition in Males

S. Short

J. Roney - Psychology

It has been shown that an interaction with an attractive female causes short-term increases in testosterone levels in males. To test a possible function of this mechanism, men engaged in a flirtatious interaction with a female confederate, and subsequently were tested for levels of physical strength, as well as competitive disposition. Although no difference was found in self-reported measures of competition, males who had interacted with the female confederate, and theoretically experienced a short-term spike in testosterone levels, scored higher in the physical strength tests than the men who interacted with a male experimenter.

The Effects of Sub-canopy Abundance

M. Silbert

D. Reed - Marine Science Institute

It is well understood that competition for light plays a dominant role in kelp forest ecosystem dynamics. One factor determining the growth and survival of algae is light limitation caused by shading of larger canopy forming species. A dense canopy can limit the available light reaching the understory (species existing beneath a canopy). To cope with this challenge some species have adapted to photosynthesize with little light requirements. My research examined the effects of varying densities of the canopy forming species, *Pterygophora californica*, on the composition of understory species. The hypothesis was that dense *P. californica* canopies would cause a decrease in understory species diversity and with a greater abundance of shade tolerant species. In regions of low density *P. californica* canopies I predicted that a higher abundance of shade intolerant species would be found. For this project I sampled 1m² areas of varying *P. californica* biomass, in which I estimated the biomass and determined percent cover of *P. californica* and cover of small algae and invertebrates. I am currently examining long-term data from the same areas taken by the Santa Barbara Coastal Long Term Ecological Research Project to determine if observed patterns of *P. californica* canopy biomass and understory

species assemblages are consistent with patterns on a larger scale, 80m². Initial observations suggest my hypothesis was incorrect, as I have found a positive relationship between *P. californica* biomass and species diversity. However, I anticipate different results with more data on the species assemblages at higher density *P. californica* canopies.

Seventh and Eighth Grade Latina/o, Chicana/o Students and College Exposure

D. Solis

C. Hudley - Gevirtz Graduate School of Education

Increasing college awareness for ethnically underrepresented students has become a concern for many institutions of higher learning in the state of California. One method of increasing early awareness is to provide students with college information at an earlier age. This study compares two groups of seventh and eighth grade students at a junior high school in the city of La Puente, California. Over a period of nine weeks, one group will be exposed to several college presentations, which will provide the students with information about prerequisites, campus life, and application tips. Each presentation will focus on a different institution of higher learning located in the state of California. Students will also be given information regarding financial assistance. The second group will not receive any kind of formal exposure in the classroom to these presentations or be given any kind of information regarding institutions of higher learning by the research team. At the end of the nine weeks, each group will take a survey comparing the two groups of students to see how the aspirations and expectations for attending college differ for those who were exposed to the presentations as compared to the group that was not exposed to the presentations. The research team hopes to learn whether or not early exposure to the college-going process has positive short-term effects on the junior high students and to assess the effectiveness of the presentations.

Abstracts—Individual Projects

The Future of the Black Family

C. Stanley

C. Woods - Black Studies

Research indicates that 70 % of African American women will not get married. Current research shows that African Americans are the least likely to get married and marry at a later age. They have shorter marriages and are more likely to divorce. Several factors contribute to the current state of African American marriages and families. In this research I analyze data collected from past and current articles, journals, literary reviews, current scholarly debates on African American marriage, debates on pop-culture's impact on Black marriage, as well as ethnographic research on intergenerational African American's perceptions on marriage through informal interviews. The data and statistics point to the fact that there is a growing problem among African American men and women that produces significant implications for the future of African American families. My research is intended to help change the current perception of African Americans towards marriage and sustaining families through the challenges of cultural stigmatism about counseling, inadequate resources to help African American families, and coping with various socio-economic stressors.

Black Radicalism, the Communist Party, and the Struggle to Liberate Haiti from American Imperialism, 1918-1930

M. Stewart

S. Yaqub - History

My research project explores the role of black radicals in the African Blood Brotherhood (ABB) and American Negro Labor Congress (ANLC), a Communist-affiliated organization, in opposing the U.S. military intervention in Haiti during the 1920s. The top leadership of these organizations comprised immigrant Afro-Caribbeans. These working-class activist-intellectuals oriented and intensified the activism of the Communist Party against the U.S. occupation of Haiti. When a major revolt in Haiti against the U.S. occupation occurred in December 1929, the ANLC and the Communist Party mobilized a series of protests in major American cities, reaching its zenith in a 2,000-person march in New York City. Although led by people of

African descent, this movement encompassed European immigrants, Asian Americans, and Latinos, creating the first multiethnic and multi-regional working-class mobilization for Haiti in U. S. history. The research for this project included trips to several archives and libraries. The paper concluded by looking at how the demonstrations for Haiti in 1929 provided the tactics and vision for later pan-African politics and mobilizations.

RNA Self-assembling Nano-structures

Z. Swank

W. Grabow - Chemistry and Biochemistry

The modularity and singular complementary nature of RNA allow us to control the arrangement of molecules on a nano-scale level through varying self-assembly techniques. Based on naturally occurring RNA motifs, nano-structures of arbitrary size and shape can be constructed by designing programmable RNA molecules that fold into a desired geometry. We have designed a cube shaped RNA nano-particle, based on a computer model that involves combining the crystallized structures of known RNA motifs together on a Swiss Protein Data Base Viewer. This particular nano-structure could have great potential in serving as a scaffold for drug delivery into the body as well as carrying si-RNA to diseased sites for therapeutic effects. We experimented with the assembly process of certain pieces of the cubic shape, in particular the corner piece. There are certain assembly protocols that can be manipulated in order to favor the folding process of certain molecules, and in this study we examined such variables as metal ion concentration and temperature of the RNA solution. We then tested the results of these various assembly strategies by visualizing the product by running different concentrations of the RNA solutions on gel-electrophoresis. Through these studies we have examined the different folding morphologies by varying the sequences of the RNA strands and the conditions under which they are assembled, which will serve as the building block for future nano-particle assembly. The results of this project will contribute to the broader goal of creating RNA cube scaffolding for si-RNA and drug delivery.

Abstracts—Individual Projects

Anthocyanins Cause Cytotoxicity in Cancer

J. Tang

L. Wilson – Molecular, Cellular, and Developmental Biology

The purpose of this project is to analyze the anticancer effects of the antioxidant drugs delphinidin, cyanidin, and Trolox on MCF7 breast cancer cells. Trolox, a vitamin E derivative, is used in comparison to delphinidin and cyanidin which are anthocyanins, water-soluble pigments that give fruits the colors ranging from red to blue. These anthocyanins are responsible for scavenging and binding free radicals via hydroxyl groups on the molecule itself. The purpose of using Trolox as a comparison is to determine if the anticancer effects are caused solely by antioxidative properties or if anthocyanins function through a separate mechanism of action. DPPH radical scavengers are utilized to compare the antioxidative strengths of delphinidin and cyanidin to the pure antioxidant, Trolox. Antiproliferative activity of MCF7 cells is measured by SRB assay, a test in which cells are drugged with varying dosages of delphinidin, cyanidin, and Trolox, stained with sulforhodamine B, and then the remaining cell density is quantified. All three compounds were capable of inhibiting MCF7 cell growth in a dose-dependent fashion. Immunofluorescence imaging with antibodies is used to physically observe the effects of the antioxidants on the morphology of MCF7 cellular components, including the DNA, tubulin, and actin. The images indicate that many cells underwent apoptosis and DNA, tubulin, and actin were heavily damaged.

Communicating Conflicting Identities

E. Thoe

W. Afifi - Communication

This study examines the impact of personal-enacted identity gaps on the mental health of individuals with conflicting identities. A personal-enacted identity gap occurs when there is a discrepancy between the personal identity of the individual, and the communicated, or enacted, identity. Where religiosity has consistently been found as beneficial to mental health, gaps created by conflicting religious and sexual identities will have adverse effects on mental well-being. Under Hecht's Communication Theory of Identity, homosexuals are predicted to experience personal-enacted identity gaps in religious and sexual identities due to stigma, with adverse effects on mental health. In this three

part experiment, the effects of identity gaps on mental health were measured in approximately 20 homosexual and 40 heterosexual participants over a three week period. Participants first completed a questionnaire measuring identity gaps, secret keeping, group identification, and mental health. The following week, participants participated in a discussion with a confederate regarding topics of social importance, where topic avoidance was measured. Finally, participants completed a second questionnaire, where changes in identity gaps and mental health were compared. It is anticipated that those experiencing personal-enacted identity gaps will not experience mental health benefits from religiosity, but will rather experience negative effects on well-being. Those with conflicting religious and sexual identities are expected to experience personal-enacted identity gaps, especially homosexual participants. Homosexual participants are predicted to be those with the largest gaps between their religious and sexual identities, thus holding the largest personal-enacted identity gaps and detriments to mental health.

The Art of Assessment: Gesture, Prosody, and Gaze during Student Art Critiques

E. Thorne

M. Bucholtz - Linguistics

Over the past few decades, scholars in various disciplines concerned with language have been calling for further research into the relationship between aspects of communication as produced in speech and aspects of communication as produced by the body (e.g., Kendon 1986, Fox 1999). This project aims to contribute to this area of research by examining how the various, multimodal aspects of communication (e.g., words, word stress, intonation, gaze, gesture) are organized in relation to each other. Using video data collected from critique sessions in undergraduate art classes, this project focuses on instances when a student standing next to or in front of another student's artwork gestures to the work and gazes back at the student artist while producing a critique of the work. Based on a close analysis of how these critiquing students time their gaze in relation to other aspects of their critique, this project argues that the act of shifting gaze from the artwork to the artist patterns in a way that reflects its strategic coordination with the speaker's words, prosody (i.e., word stress and intonation), and deictic gesture (i.e., pointing). The position of these gaze shifts also reveals the

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presence of phases within the structure of deictic gesture, which I call a “trajectory phase” and a “completion phase.” Overall, these findings promote and support the approach of studying language as an interactive, embodied practice.

Identifying and Characterizing Chromosome Breakage Sequences (CBS) of *Tetrahymena thermophila*

L. Tran

E. Orias – Molecular, Cellular, and Developmental Biology

Tetrahymena thermophila is a unicellular eukaryote, belonging to the ciliated protozoa. This excellent model organism has been responsible for many important discoveries such as the first cell motor, telomere structure and maintenance, and catalytic RNA. *T. thermophila* has two different types of nuclei, the transcriptionally silent, diploid micronucleus (MIC) with 5 pairs of chromosomes and the expressed, 45-ploid macronucleus (MAC). During MAC differentiation the 181 MAC chromosomes are generated when the MIC chromosomes are cut at specific sequences called chromosome breakage sites (Cbs) and telomeres are added to the new ends. So far, over 120 chromosome breakage sequences (Cbs) have been identified. My objective is to find the remaining Cbs. PCR primers were designed near the ends of MAC chromosomes not yet associated with a Cbs. The primers were tested in pairwise combinations to identify which combinations give rise to specific PCR products. These PCR products were cloned and sequenced to confirm they contain a Cbs. So far, I've assembled the left arm of MIC chromosome 1 as a chain of Cbs-linked MAC chromosomes in their correct order and orientation. I will attempt to use the same method for MIC chromosome 2. Identifying all the Cbs of *T. thermophila* is important because it relates the MAC genome sequence to the germline MIC sequence from which it was derived. This information will enhance the usefulness of this model organism by facilitating forward genetics, i.e., identifying the gene associated with a mutant phenotype.

Knots of Light and Twistor Functions

A. Troesch

D. Bouwmeester - Physics

Alternative representations of knotted beams of light involving the null shear-free geodesic constructions of Kerr and Robinson are considered, including algebraic representations involving functions of a twistor variable in projective null twistor space. An exact correspondence between the Robinson congruence and knotted solutions of the Maxwell equations is expected.

Fluorescing Silver Nanoclusters on DNA

L. Velazquez

P. O'Neill - Physics

Little is known about fluorescent DNA-bound Ag clusters but the use of fluorimetry, mass spectroscopy and absorbance measurements is enabling us to reveal more information on the stability, composition and quantum yield of these structures. We have been working most extensively with a DNA hairpin that has a 7 base-pair stem and closes in a single stranded loop of 9 cytosines. Different concentrations of silver yield different peaks in fluorescence causing us to believe that different number of silver atoms attached to the DNA structure account for this difference. Mass spectroscopy of our 9C green-fluorescing clusters at 200 μ M AgNO₃ yields a high peak in the Ag₁₁ atom cluster but also smaller peaks in other cluster sizes; this prevents us from being able to determine specifically which cluster size is responsible for the visible fluorescence given off. After running multiple experiments on different silver concentrations of clusters, we were able to purify clusters in 400 μ M AgNO₃ via gel electrophoresis to get the same fluorescing green peak and only one peak in the mass spectra. This data tells us that gel electrophoresis has a way of stabilizing cluster sizes and it also strongly confirms our theory that clusters with a certain number of silver atoms within the hairpin loop are responsible for different emission spectra.

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Creating AcrB Mutants that Confer Resistance to E. Coli

I. Velsko

D. Low – Molecular, Cellular, and Developmental Biology

Contact-dependent growth inhibition (CDI) is a process by which one bacterium delivers a toxin directly into another upon touching it. CDI is controlled by three genes, *cdiA*, *cdiB*, and *cdiI*. The mechanism by which the toxin is delivered is unknown, but it is believed that the carboxy-terminal end of the CdiA protein of one bacterium interacts with the inner-membrane drug-efflux pump protein AcrB in the targeted cell. In order to understand how the carboxy-terminal end of CdiA uses AcrB to enter the target cell, this study created and selected for mutant AcrB proteins that conferred resistance to CDI without losing drug-pumping ability. CDI resistant cells were found in ten independent pools; however, we have not yet identified a mutation in AcrB. We have found that the sequence of AcrB that we used differs from the published sequence by a single alanine to valine change at position 738, yet this does not affect CDI sensitivity or drug-pumping ability. Studying CDI is important as it may play a crucial role in virulence of bacteria such as uropathogenic *E. coli*, which cause urinary tract infections. Understanding the mechanism could present new targets for antimicrobial drug design.

Le Canibal

M. Veluz

D. Moseley – Theater and Dance

The purpose of this project was to re-stage a cannibal-inspired piece, originally made for the UCSB Junior's annual Choreography Concert, onto the 2009-2010 UCSB Student Dance Company. The process required redefining and adding cannibalistic characters as well as preparing the piece to be apart of the Company's Touring Repertoire. At the most basic level, this piece questions group interaction and relationships in a situation where survival is necessary.

Finding the Source of a SB Channel Methane Plume

C. Villanueva

F. Kinnaman, D. Valentine - Earth Science

Evidence from water samples collected during the SEEPS 2009 research cruise and previous studies indicate consistent methane release into Santa Barbara Channel waters. A surface methane plume originates from petroleum seeps with a significantly high amount of seepage located at Coal Oil Point. This investigation has also shown the existence of a mid-water (~200 m depth) and deep-water (500-600 m depth) methane plume. This study examines methane concentrations, methane oxidation rates, and water currents in an attempt to constrain the location, strength, and fate of the mid-water methane plume in the Santa Barbara Channel. Findings suggest that the mid-water plume originates from seeps located on the Mid-Channel Trend feature of the Santa Barbara Channel.

Reevaluation of *Dabashanites mirus*

M. Villarosa Garcia

S. Porter - Earth Science

Since it was first described by Chen (1979), *Dabashanites mirus*, a multi-bladed sclerite, continues to be an enigmatic metazoan fossil. Although others have encountered dabashanitid samples in their explorations (Kerber 1988, Demidenko and Parhaev 2006, Steiner et al. 2004), no one has carried out an in depth study, likely due to a dearth of specimens to work with, though taxonomic associations have been proposed. A recently established secondary site from Dailibaoqing, Yunnan, China, of the Zhujiang Formation dated to 538mya, has yielded over 50 specimens of *Dabashanites mirus* along with a diverse assemblage of other early Cambrian microfossils. These dabashanitid specimens exhibit variations in the number and degree of flexibility of blades, as well as differences in point of origin from the central base. We establish two morphotypes, asymmetric, and symmetric, based on blade characteristics. The asymmetric forms exhibit chirality supporting the idea of a bilateral organism. The complexity of the structure suggests the sclerite's function could be to uptake nutrients or gases. We propose a redefinition of the group and revision of its relationship to *Siphogonuchites*, another sclerite form, with which it has previously been synonymized.

Abstracts—Individual Projects

Have You Any News?

M. Weinger

P. Cohen - History

I researched the journalists of the Mexican-American War and the ways they influenced public perception about the war and the United States. The journalists of this conflict, which lasted from 1846-1848 and was the United States' first foreign war, were the first embedded war correspondents. Through my research, I discovered that the journalists did not just observe the war, but sought to use the conflict to develop the nation into something decidedly new. The correspondents were not simply reporting on the scene — they also engaged in creating and nurturing a vision and narrative of America steeped in innovation, destiny and expansion. I developed my thesis through archival work at the University of Texas at Arlington, which houses the largest collection of documents on the war in the world, thanks to an URCA grant. I examined newspapers, books, letters and art to explore the impact of these embedded journalists on the United States in the 1840s.

AgDNA Diffusion

P. Weitekamp

D. Fygenson - Physics

We plan to make a precise measurement of the diffusion coefficient for AgDNA nanoclusters synthesized in our lab. Our method, termed "Continuous Bleaching," uses only a standard fluorescence microscope and a source of high energy radiation, a mercury bulb, to create a continuously bleached area of sample in the masked field of view. This is possible due to the phenomenon "photobleaching," that describes how initially fluorescing molecules will go dark after continuous bleaching at a measurable rate. By diffusion, unbleached molecules will flow into the masked field of view at the same rate bleached molecules flow out. From the ensuing intensity gradient we can study diffusion along the edges of our field of view. We anticipate that our results will bring us within a 10% margin of error of the true diffusion coefficient. Knowing this constant, we can optimize the potential of the AgDNA nanoclusters for practical bio-chemical applications.

There is Always a Hope: The Revolutionary Life of Kazu Iijima

M. White

E. Boris - Feminist studies

D. Fujino - Asian American Studies

This project examines the historical trajectory of Japanese American women radical activism through the lens of feminist analysis. Specifically, my project examines the life of Kazu Iijima (1918-2007), a Japanese American woman whose political activism spanned across three important historical periods of the Japanese American Left. Throughout the Great Depression, Kazu Iijima participated in the Oakland Young Nisei Democrats and the Young Communist League. Following the attack on Pearl Harbor, Iijima spent World War II incarcerated in the Topaz concentration camp. Nevertheless, she continued her political activism in the Japanese American Committee for Democracy, an anti-fascist organization, after resettling in New York City. In 1968, Iijima co-founded Asian Americans For Action (Triple A), a pioneering pan-Asian American political organization that initiated the New Left Asian American movement on the East Coast. Since previous scholars have failed to adequately address the full scope of Kazu Iijima's political activism, my study analyzes a range of neglected primary sources from multiple historical archives. I consulted archival material at the following facilities: Charles Young Special Collections library at UCLA, the Tamiment Library at New York University, the Hoover Institution at Stanford, and the Bancroft Library at UC Berkeley. The URCA Grant helped fund my trip to Stanford and Berkeley. Through the life of Kazu Iijima, the conclusion of my thesis complicates the neat division between the Old Left and the New Left in U.S. historiography by demonstrating the long historical movement of Japanese Americans for social justice.

Henry Spira and the SHAC 7

S. Woods

L. Kalman - History

My project compares animal rights activist campaigns, targeting animal researchers, in 1976 and 2006. I compared Henry Spira's campaign against the American Museum of Natural History in 1976 with the Stop Huntingdon Animal Cruelty (SHAC) campaign which targets Huntingdon

Abstracts—Individual Projects

Life Sciences. By studying the two campaigns, I hoped to discover that the Internet was accountable for the differences between them. Instead, I concluded that the lack of leadership in the SHAC campaign, as well as SHAC's use of violence, prevented it from reaching the same level of success as Henry Spira.

The Ancient Greek Approach to Healing

L. Yedor

R. Gallucci - Classics

Medicine, as we know it today, is a scientific tradition that evolved out of many attempts to answer the question of why do we get sick and how do we fix it? This basic question of human health has plagued scientists and philosophers for thousands of years. Many avenues of healing have been explored producing different traditions around the world. Today, throughout the western world, conventional "western" medicine dominates as the accepted means of healing the sick. But where did this tradition begin? Western society itself stems largely from the ancient Greek tradition. Therefore, this study looks at the origins of western medicine in the ancient Greek world. The temple cults of Apollo and Asclepios and the role of religious ritual in healing practices will be examined along with the philosophical influences on the early scientific approach to medicine.

CORWIN PAVILION

